U.S. Department of the Interior
Bureau of Land Management

DRAFT STANDARDS AND GUIDELINES FOR RANGELAND HEALTH ASSESMENT

Blue Basin Allotment (02104)

September, 2014

Location: Elko County, Nevada

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Table of Contents

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I – INTRODUCTION

The Bureau of Land Management (BLM) grazing regulations in 43 CFR 4130.3-1(c) require that grazing permits issued by the BLM contain terms and conditions that ensure conformance with BLM regulations in 43 CFR 4180, which are the regulations under which the *Northeastern Great Basin Standards and Guidelines for Grazing Administration (1997)* were developed. Recently, the Tuscarora Field Office completed an assessment of the achievement of these standards on the Blue Basin Allotment. The results of this assessment are presented in this report.

A standards and guidelines assessment analyzes monitoring information and assessments, and then makes determinations regarding:

A. Progress towards or attainment of the standards for rangeland health, and
B. Whether livestock management is in conformance with the guidelines, and
C. Whether existing grazing management or levels of grazing use are significant factors in failing to achieve the standards or conform to the guidelines.

Standards for rangeland health have been established for northeastern Nevada which includes the area administered by the Tuscarora Field Office. The approved standards and guidelines for rangeland health applicable to this assessment area are as follows:

Standard 1. Upland Sites**:** Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate and landform.

Guidelines

1.1 Livestock grazing management and wild horse and burro population levels are appropriate when in combination with other multiple uses they maintain or promote upland vegetation and other organisms and provide for infiltration and permeability rates, soil moisture storage, and soil stability appropriate to the ecological site within management units.

1.2 When livestock grazing management and wild horse and burro herd management alone are not likely to restore areas of low infiltration or permeability, land management treatments should be designed and implemented where appropriate.

1.3 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

Standard 2. Riparian and Wetland Sites**:** Riparian and wetland areas exhibit a properly functioning condition and achieve state water quality criteria.

Guidelines

2.1 Livestock grazing management and wild horse and burro population levels will maintain or promote sufficient vegetation cover, large woody debris, or rock to achieve proper functioning condition in riparian and wetland areas. Supporting the processes of energy dissipation, sediment capture, ground water recharge, and stream bank stability will thus promote stream channel morphology (e.g., width/depth ratio, channel roughness, and sinuosity) appropriate to climate, landform, gradient, and erosional history.

2.2 Where livestock grazing management and wild horse and burro herd management areas are not likely to restore riparian and wetland sites, land management treatments should be designed and implemented where appropriate to the site.

2.3 Livestock grazing management and wild horse and burro herd management will maintain, restore or enhance water quality and ensure the attainment of water quality that meets or exceeds state water standards.

2.4 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

Standard 3. Habitat**:** Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

Guidelines

3.1 Livestock grazing management and wild horse and burro population levels will promote the conservation, restoration and maintenance of habitat for threatened and endangered species, and other special status species as may be appropriate.

3.2 Livestock grazing intensity, frequency, season of use and distribution and wild horse and burro population levels should provide for growth and reproduction of those plant species needed to reach long-term land use plan objectives. Measurements of ecological condition and trend/utilization will be in accordance with techniques identified in the Nevada Rangeland Monitoring Handbook.

3.3 Livestock grazing management and wild horse and burro management should be planned and implemented to allow for integrated use by domestic livestock, wildlife, and wild horses and burros consistent with land use plan objectives.

3.4 Where livestock grazing management and wild horse and burro herd management alone are not likely to achieve habitat objectives, land treatments may be designed and implemented as appropriate.

3.5 When native plant species adapted to the site are available in sufficient quantities, and it is economically and biologically feasible to establish or increase them to meet management objectives, they will be emphasized over non-native species.

3.6 Livestock grazing management and wild horse and burro herd management are adequate when significant progress is being made toward this standard.

Standard 4. Cultural Resources**:** Land use plans will recognize cultural resources within the context of multiple-use.

Guidelines

4.1 Rangeland management plans will consider listing of known sites that are National Historic Register eligible or considered to be of cultural significance and new eligible sites as they become known.

4.2 Wild horse and burro herd management will be designed to avoid or mitigate damage to significant cultural resources.

This assessment does not include an assessment of Standard 5 (Healthy Wild Horse and Burro Populations) because there are no wild horse herd management areas in this allotment.

II – ALLOTMENT DESCRIPTION

Blue Basin Allotment –

The Blue Basin Allotment boundary is located approximately one mile west of Elko, Nevada and runs approximately seventeen miles north and west of town. Elevations range from 5,200 feet at the southern end to over 7,500 feet at the northern peaks. This assessment covers approximately 50,374 acres of land within the Blue Basin Allotment; of which, 37,304 acres are public land and 13,070 acres are privately owned.

The Blue Basin Allotment is divided into ten pastures including North Lone Mountain, South Lone Mountain, Stinson, Stinson Riparian, Louse, Adobe, Susie, Airport, East Avenel, and West Avenel (refer to Map 1, Appendix B). Airport, East Avenel, and West Avenal pastures are characterized by crested wheatgrass seedings established in the 1960's, although sagebrush and other shrubs have become re-established over much of this area. Most pastures support high priority riparian and upland habitats important for a wide variety of wildlife species including the Greater Sage-grouse, mule deer, pronghorn antelope, and a number of species considered special status because of relatively low numbers across their range. The Blue Basin Allotment also includes portions of Susie Creek, a potential reintroduction stream for Lahontan cutthroat trout (*Onchorynchus clarki henshawi*) a federally listed threatened species.

More detailed information on baseline environmental conditions as well as wildlife resources in the Blue Basin Allotment is included in Appendix 1.

Heguy Ranches, Inc. (Authorization 2701506) and Heguy Ranch, LLC (Authorization 2703954) are the only livestock grazing authorizations on the allotment. Both livestock permits are utilized by the same operator. Authorization 2701506 is for cattle and horse use and authorization 2703954 is only for cattle use, with a combination total of 6,467 active Animal Unit Months (AUMs). The information for these authorizations is summarized in Table A below.

Table A. Livestock Use Authorizations Information

Allotment	Livestock Type	Authorized AUMs	# of Livestock	Permit Dates
Authorization Number 2701506				
Blue Basin	Cattle	4,208	690	4/1 - 11/15
	Horse	62	15	4/1 - 9/1
Authorization Number 2703954				
Blue Basin	Cattle	168	168	4/1 - 5/1
	Cattle	88	227	4/20 - 5/1
	Cattle	1,654	395	5/2 - 9/8
	Cattle	236	198	9/9 - 10/15
	Cattle	47	47	10/16 - 11/15

Beginning in about 2005, grazing management has been focused on improving priority riparian resources within the allotment. Over the past nine years, BLM, livestock permittees, and other partners have been working to reduce frequency and duration of hot season grazing on priority

riparian habitats through prescriptive grazing management, construction of riparian pasture fencing, and use of water developments on private lands. In 2012, Heguy Ranches, in cooperation with the U.S. Fish and Wildlife Service, developed water sources on their private lands which reduced pressure on many of the riparian areas. The Stinson Riparian Pasture was added to the allotment in 2007 after the Red House Fire to help minimize the grazing impacts on Susie Creek. Rotational grazing strategies have also been applied to most pastures in the allotment in recent years. This approach is having a positive influence on resource conditions on the allotment.

The Blue Basin Allotment is mostly dominated by a sagebrush steppe ecosystem. Mixtures of basin big sagebrush (*Artemisia tridentata*), antelope bitterbrush (*Purshia tridentata*), and numerous species of perennial, native bunchgrass make up the majority of the vegetation composition. Also, areas of Pinyon-Juniper woodlands can be found in the higher elevations. Riparian vegetation includes several perennial and intermittent drainages, numerous seeps and springs and scattered pockets of quaking aspen (*Populus tremuloides*) at the higher elevations. Besides aspen, common riparian plants include Nebraska sedge (*Carex nebrascensis*), Arctic rush (*Juncus articus*), spikerush (*Eleocharis* spp.), and several species of willow (*Salix* spp.).

Since 1999, wildfires have burned nearly 30,000 acres in the Blue Basin Allotment. As recently as 2006 and 2007, the Basco, Susie and Red House fires burned approximately 40% of the allotment. The fires have had significant effects on vegetative communities causing loss of sagebrush habitat and an increase in grasses and forbs. As noted in the uplands section (Appendix A) of this assessment, many burned areas were rehabilitated with native seed mixes, which are showing good to excellent success in most areas of the allotment.

Greater Sage-Grouse (*Centrocercus urophasianus*; sage-grouse), a Candidate Species for listing as Threatened or Endangered under the Endangered Species Act, has Preliminary Priority Habitat (PPH) within the Blue Basin Allotment. PPH comprises areas that have been identified as having the highest conservation value to maintaining sustainable Greater Sage-Grouse populations; including, breeding, late brood-rearing and winter concentration areas. The Blue Basin Allotment contains approximately 39,844 acres of PPH for sage-grouse (Appendix B, Map 3).

This allotment provides habitat for numerous other wildlife species that may use areas of the allotment during all or portions of the year, including migratory birds, raptors, small and large mammals, reptiles, amphibians, and bats. Some of these may be BLM Special Status Species. See Appendix C for a list of Elko District BLM Special Status Species.

Key areas are study locations established in an allotment within the dominant ecological site(s) to monitor changes to vegetation species, soils, and other changes due to management actions. There are six rangeland key areas, 7, 8, 8A, 16A, DW-4-05 and DW-4-01, within in the Blue Basin Allotment. In addition, there are four wildlife monitoring sites, DW-T-87-03, DW-4-01, DW-4-05, and CDS-T-87-04 (See Appendix B, Map 1). Permanent monitoring sites have also been established on priority stream and riparian habitats (See Appendix B, Map 2).

III – DRAFT DETERMINATIONS

Draft determinations regarding achievement of Rangeland Health Studies for the Blue Basin Allotment are summarized in Table B.

Table B. Draft determinations for the Blue Basin Allotment

Standard	Determination	Contributing Factor	Guidelines Conformance
Upland Sites	Achieving the Standard	N/A	In Conformance
Riparian & Wetland Sites	Not Achieving, Making Progress Toward Standard	N/A	In Conformance
Habitat	Achieving the Standard	N/A	In Conformance
Cultural Resources	Achieving the Standard	N/A	In Conformance

Part I. Guideline and Standard Achievement Review

Standard 1. Upland Sites

Upland soils exhibit infiltration and permeability rates that are appropriate to soil type, climate, and land form.

As indicated by:

- Indicators are canopy and ground cover, including litter, live vegetation and rock, appropriate to potential of the site. As well as species diversity and annual production.

Draft Determination: Achieving the Standard

Canopy and ground cover were measured at rangeland key areas 7, 8, and 16A in 2005 and 2011 using the point cover method. (Key area location can be found in Appendix B, Map 1.) These data were then compared to reference rangeland ecological site descriptions (ESD) data available at the key areas to determine whether or not the standard was being met. Frequency has been collected at key areas 7, 8, 16A, DW-4-05, and DW-4-01 in 2005 and again in 2011 for key areas 7, 8, 16A, and DW-4-01. Data was collected at key area DW-4-05 in 2012, but was not included in this analysis, due to removal of permanent location markers during fire rehabilitation activities in 2007. Permanent makers were reestablished in 2012 at DW-4-05 and will serve as baseline data for future vegetation studies. These data were collected using nested frequency methods, respectively (Nevada Range Studies Task Group 1984).

In addition, production was collected in 2005 and 2012 at key areas 7, 8A, DW-04-05, and DW-4-01. A majority of the key area data for the Blue Basin Allotment show an increase of grass and forb species composition, with a decrease in the shrub component. This is likely due to recent fire activity in the allotment over the past decade. However, random production sampling throughout the allotment show a stronger than expected shrub component, based on soil survey and ecological site descriptions developed by the Natural Resource Conservation Service (NRCS). These data were collected using the double weight sampling, respectively (Nevada Range Studies Task Group 1984). Key area location can be found in Appendix B, Map 1.

Rangeland monitoring data collected at key areas show that there has been a change from a sagebrush steppe mosaic toward a more grass and forb dominated site in much of the Blue Basin Allotment. However, since 2005 all of the upland long term key areas on the allotment have been burned by wildfires, except for key area 8. Significant changes in the plant community from a climax sagebrush plant community to an early seral grassland dominated plant community have occurred at key areas 7 and 16A. The increase in grasses and forbs may be due to the high amount of precipitation received in 2010/2011 and/or the rotational grazing system implemented after the 2007 Red House Fire. For unburned key area 8, statistically significant increases in the amount of grasses and forbs, and overall biodiversity in the plant community occurred between 2005 and 2008. There were also notable decreases in cheatgrass percentages.

Rangeland monitoring data and professional observation support the assertion that the Blue Basin Allotment is meeting the Upland Site standard. The recent drought, as well as fire activity within the allotment was taken into consideration in conjunction with rangeland data collected.

This is a principally important factor with regard to biotic diversity and annual production in the area. In much of the allotment there has been an increase of invasive species, likely due to a change in functional structural groups of perennial bunch grasses; however, the current vegetative composition and frequency of such vegetation have maintained significant integrative properties in regard to hydrologic function and soil/site stability through root growth and contributing litter cover, as well as effectively decreasing cheatgrass occurrence. Consideration of the rangeland health data and other factors above, while not optimal, support the assertion that Standard 1 is being met within the Blue Basin Allotment.

Standard 2. Riparian and Wetland Sites

Riparian and wetland areas exhibit a properly functioning condition (PFC) and achieve state water quality criteria.

As indicated by:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows. Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics.
    - Width/Depth ratio; channel roughness, sinuosity of stream channel, bank stability, vegetative cover (amount, spacing, life form), and other cover (large woody debris, rock).
    - Natural springs, seeps and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.
    - Chemical, physical, and biological waters constituents are not exceeding the state water quality standards.

Draft Determination: Not Achieving, Making Progress Towards Meeting the Standard

The rangeland health standard for riparian and wetland areas has been met or at least partially met for most pastures and priority riparian areas within the Blue Basin Allotment (Table C). Efforts to control and manage livestock starting in 2007 have resulted in improvements to riparian areas in most pastures with priority riparian resources. These include the Stinson Riparian, Adobe and Susie pastures. In pastures receiving more frequent hot season grazing including Stinson, Louse and North Lone Mountain pastures, results are more varied. Prior to 2007 grazing was not well controlled and livestock generally remained in most pastures throughout the season. Where standards have not been fully met, livestock grazing is the causal factor.

Table C. Achievement of riparian/wetland standard for priority riparian habitats, Blue Basin Allotment.

	Riparian Habitat	
Pasture	**Lotic (flowing water)**	**Lentic (standing water)**
Stinson Riparian	Met/Progress toward meeting	Met
Stinson	N/A	Progress towards meeting
Louse	Progress toward meeting	Progress towards meeting
North Lone Mountain	N/A	Met
Adobe	Met	Met
North Susie	Progress towards meeting	Progress towards meeting
South Susie	N/A	Met

Water quality data indicate water quality standards have been mostly met although data are limited. High levels for phosphorus on Susie and Adobe Creek and a relatively high value for total dissolved solids on Susie Creek suggest the need for further sampling and evaluation. Upstream uses on private lands may be contributing to nutrient enrichment on these streams.

Considering that water quality data are limited for the Blue Basin Allotment and that numerical temperature standards for streams may not be appropriate or even achievable (Pahl 2010), improved riparian habitat conditions are inferred to improve trends in water quality. Increases in riparian vegetation and development of narrower, deeper channels and more functional floodplains will act to filter and trap sediments and nutrients as well as to moderate effects of ambient conditions on stream temperatures. As described above, changes in grazing practices have resulted in improvement in most priority riparian habitats on the Blue Basin Allotment.

Standard 3. Habitat

Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover, and living space for animal species and maintain ecological processes. Habitat conditions meet life cycle requirements of threatened and endangered species.

As indicated by:

- Vegetation composition (relative abundance of species);
- Vegetation structure (life forms, cover, height, or age class);
- Vegetation distribution (patchiness, corridors);
- Vegetation productivity; and
- Vegetation nutritional value.

Draft Determination: Achieving the Standard

Habitats exhibit a healthy, productive, and diverse population of native and/or desirable plant species, appropriate to the site characteristics, to provide suitable feed, water, cover and living space for animal species in order to maintain ecological processes. Habitat conditions meet life

cycle requirements of threatened and endangered species. Based on available information, the rangeland health standard for habitat is being met. Current livestock grazing management is considered to be in conformance with set guidelines.

Current mule deer habitat:

- Crucial mule deer winter range habitat has been rated to be in "Excellent" condition as indicated by monitoring completed in 2005 and 2012.
- Intermediate mule deer range has been rated to be in "Fair" condition in 2012 with potential long term impacts associated with post-wildfire cheatgrass composition. The same study site provided habitat that rated as being in "Good" condition during monitoring in 2005.
- Mule deer summer habitat was rated as being in "Good" condition in 2005 and 2012 although the transect area was negatively affected by the 2006 Basco Fire.

Bitterbrush has been maintained in satisfactory age and form class as monitored at four key study transects. This helps to allow for maintenance of this shrub, which is an important species for forage and cover diversity for mule deer and other game and nongame species, and ongoing ecological site dynamics.

Sage-Grouse monitoring data collected in 2012 indicate that sage-grouse breeding habitat (nesting), brood-rearing habitat and winter habitat quality has been affected by the 2006 Basco Fire. Herbaceous native perennial grass and forb cover and height exceeded Western Association of Fish and Wildlife Agencies (WAFWA) guidelines. Sagebrush and other shrub cover is below recommended guidelines although sagebrush is slowly recovering primarily due to post-wildfire rehabilitation efforts. Current improvement in both lentic (standing water) and lotic (flowing water) riparian habitats will enhance late summer brood rearing habitat.

As a sagebrush-obligate, landscape scale species and current candidate for listing as a Threatened or Endangered Species, sage-grouse is an appropriate umbrella species to represent the needs of a suite of sagebrush-obligate and near-obligate species, including sage thrasher (*Oreoscoptes montanus*), pygmy rabbit (*Brachylagus idahoensis*) (both BLM Sensitive Species), Brewer's Sparrow (*Spizella breweri*), sagebrush sparrows (*Artemisiso nevadensis*), and sagebrush vole (*Lemmiscus curtatus*). It is assumed that managing for habitat characteristics that benefit the sage-grouse will also generally benefit other species that fall under that sage-grouse "umbrella" (Rowland et al. 2006).

In regard to wildfire impacts, completed wildfire rehabilitation, current grazing practices and sage-grouse as an "umbrella" species, vegetative monitoring indicate that perennial native herbaceous vegetation is being maintained for migratory birds and for many other species of wildlife including those designated as Special Status Species. In the case of pygmy rabbits, habitat for this species is considered "good" based on recent improvements in riparian areas and on findings for mule deer and for sage-grouse. Similarly, habitat conditions for the prey species of golden eagles, burrowing owls and other raptors (Appendix C) would also be expected to be in "good" condition.

Standard 4. Cultural Resources

Land use plans will recognize cultural resources within the context of multiple-use.

Draft Determination: Achieving the Standard

Rangeland management plans, including term grazing permit renewals, will consider known Cultural Resource sites that are eligible for listing on the National Register of Historic Places (NRHP) or considered to be of cultural significance as well as new NRHP eligible sites as they become known. Based on evaluation of existing information pertaining to range improvements and grazing management, Cultural Resources are being recognized within the context of multiple-use management in the Blue Basin Allotment.

IV – SIGNATURE PAGE

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Richard E. Adams
Field Manager
Tuscarora Field Office

Date

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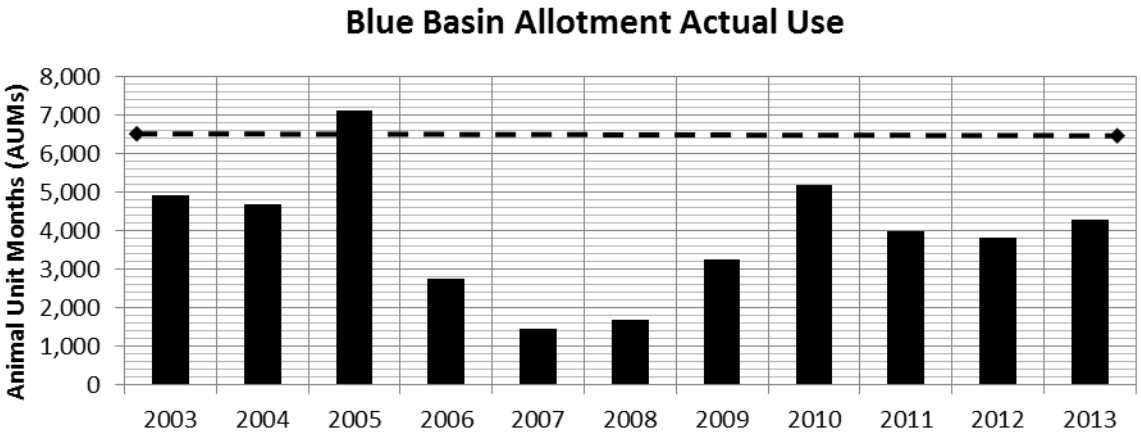
Appendix A. Data Summary

A.1. Livestock Actual Use

Livestock actual use data for 2003 to 2013 are summarized in Figure 1. Annual variation in livestock use has occurred for several reasons including various business decisions of the permittees, annual forage availability, and transfers in grazing preference.

Figure 1. Blue Basin Allotment actual use, spanning from 2003-2013, dashed line indicates the active grazing preference for the allotment (6,467 AUMs).



A.2. Key Area and Ecological Sites

A key area is a relatively small portion of an allotment selected as a representative monitoring point for measuring change in vegetation or soil and the impacts of management. It is chosen because of its location, use, and value. It is assumed that key areas, if properly located, will reflect the current management over similar important areas in the unit (Swanson et al. 2006). Table 1 depicts the location, ecological site, dominant species, and soil mapping unit of the key area within the Blue Basin Allotment. For locations of key areas, refer to Appendix B, Map 1.

Table 1. Blue Basin Allotment key area ecological site and location.

Key Area	Pasture	Location	Ecological Site	Dominant Species (from ESD)	Soil Mapping Unit
DW-T-87-03	Susie	T34N;R54E Sec 10 NW, SW	South Slope 12-14" P.Z. (R025XY009NV)	mountain big sagebrush, antelope bitterbrush, bluebunch wheatgrass	Sumine-Cleavage-Cleavage, very cobbly association
DW-4-01	Susie	T34N;R54E Sec 4 NE, NW	South Slope 12-14" P.Z. (R025XY009NV)	mountain big sagebrush, antelope Bitterbrush, bluebunch wheatgrass	Sumine-Cleavage-Cleavage, very cobbly association

DW-4-05	West Avenal	T34N;R54E Sec 34 SE, SW	Loamy 8-10" P.Z. (R025XY019NV)	Wyoming big sagebrush, bluebunch wheatgrass, Thurber's needlegrass	Wieland-Tuffo-Chiara association
16A	Louse	T36N;R53E Sec 26 NE, SE	Loamy 10-12" P.Z. (025XY014NV)	big sagebrush, bluebunch wheatgrass, Thurber's needlegrass	Stampede-Donna-Bilbo association
7	Stinson	T36N;R53E Sec 14 SE, NW	Claypan 12-16" P.Z. (025XY017NV)	low sagebrush, Idaho fescue, bluebunch wheatgrass	Chen, moderately steep-Chen-Lerrow association
CDS-7-87-04	Stinson	T36N;R53E Sec 14 NE, NW	Claypan 12-16" P.Z. (025XY017NV)	low sagebrush, Idaho fescue, bluebunch wheatgrass	Chen, moderately steep-Chen-Lerrow association
8	North Lone Mountain Native	T36N;R54E Sec 7 SW, SE	Loamy 10-12" P.Z. (025XY014NV)	big sagebrush, bluebunch wheatgrass, Thurber's needlegrass	Stampede-Donna-Bilbo association
8A	Lone Mtn Pasture Seeding	T36N;R54E Sec 7 SW, SW	Loamy 10-12" P.Z. (025XY014NV)	big sagebrush, bluebunch wheatgrass, Thurber's needlegrass	Stampede-Donna-Bilbo association

An ecological site is a kind of land with a specific potential natural community and specific physical site characteristics, differing from other kinds of land in its ability to produce vegetation and to respond to management (Holechek et al., 2010). An Ecological Site Description (ESD) is used to provide reference in the inventory, evaluation, and management of native vegetation communities. The ecological site of a key area is determined based on several factors including soils, topography, and the plant community.

A.3. Community Composition

Community composition was measured by collecting production data at KA-07, KA-8A, DW-04-05, DW-4-01, as well as random location sampling throughout the Adobe, Airport, and Lone Mountain Pastures in the Blue Basin Allotment using the double weight sampling method. Production is defined as the amount of aboveground air-dry biomass produced annually within a site. The double weight sampling method is a commonly used method for estimating production (BLM 1999a; Nevada Range Studies Task Group 1984). These data are summarized in Tables 2-3.

Table 2. Community composition data collected for key areas in the Blue Basin Allotment (displayed as %)

Class	Key Area	PNC	2005	2012
GRASS	KA-07	**60**	41.45	28.25
	KA-8A	**65**	47.39	68.86
	DW-04-05	**65**	21.29	30.05
	DW-4-01	**65**	61.51	76.15
FORB	KA-07	**15**	33.43	55.31
	KA-8A	**10**	34.69	12.54
	DW-04-05	**5**	9.63	22.29
	DW-4-01	**10**	5.61	22.11
SHRUBS	KA-07	**25**	25.12	16.23
	KA-8A	**25**	17.92	18.6
	DW-04-05	**30**	69.08	47.66
	DW-4-01	**25**	32.88	1.74

*(PNC - Potential natural community, data extracted from ecological site descriptions available for each key area.

Table 3. Community composition data collected randomly in the Blue Basin Allotment (displayed as %).

Class	Pasture	PNC	2012
GRASS	Adobe	**60**	39.96
	Airport	**60-65**	3
	Lone Mtn.	**60-65**	60.9
	Lone Mtn.	**60-65**	40.18
FORB	Adobe	**15**	3.74
	Airport	**5-10**	2.81
	Lone Mtn.	**10-15**	32.84
	Lone Mtn.	**10-15**	45
SHRUBS	Adobe	**25**	56.31
	Airport	**30**	94.19
	Lone Mtn.	**25**	6.26
	Lone Mtn.	**25**	13.18

*(PNC - Potential natural community, data extracted from ecological site descriptions available for each key area.

A.4. Frequency

Frequency is the number of times a plant species is present in a given area. The concept of frequency refers to the uniformity of a species in its distribution over an area. Frequency data were collected within the Blue Basin Allotment at key areas 7, 8, 16A, DW-4-05, and DW-4-01 in 2005 and again in 2011 for key areas 7, 8, 16A , and DW-4-01. Data was collected at key area DW-4-05 in 2012, but was not included in this analysis, due to removal of permanent location markers during fire rehabilitation activities in 2007. Permanent makers were reestablished in 2012 at DW-4-05 and will serve as baseline data for future vegetation studies. Frequency data

was collected using the nested frequency method (Nevada Range Studies Task Group 1984). Figures 2-4 summarizes these data (with standard deviation shown).

Figure 2. Percent frequency of vegetation, KA-07, Blue Basin Allotment, 2005 & 2011.

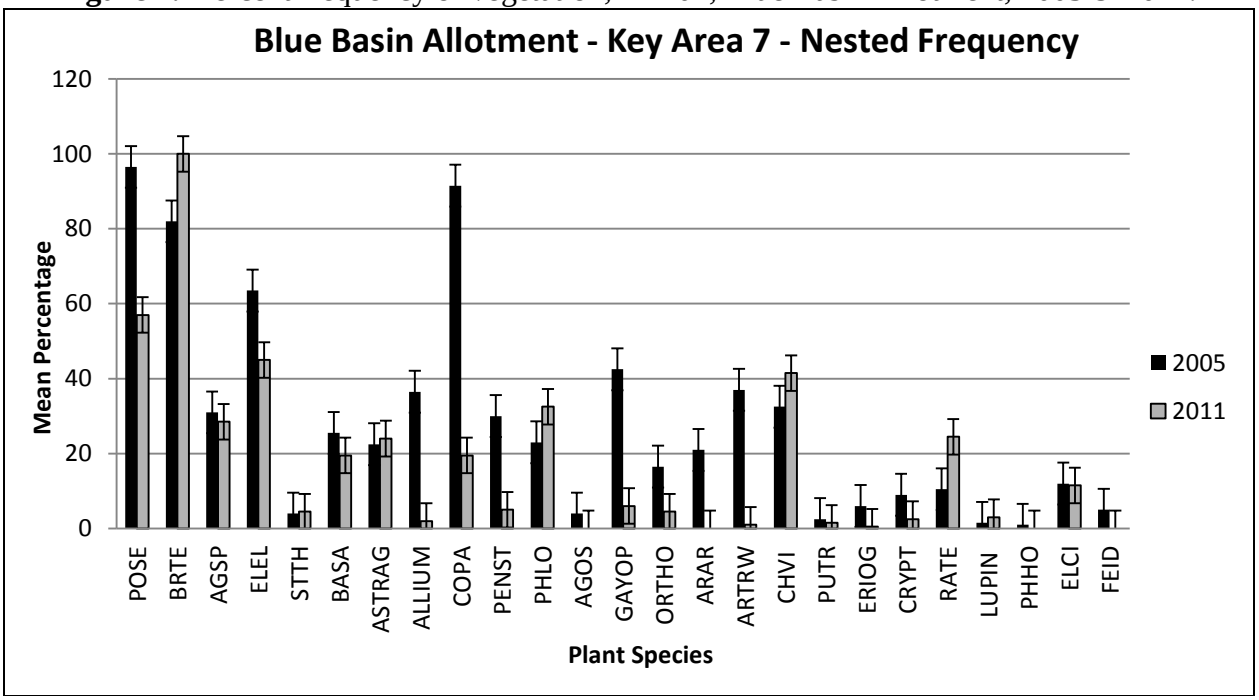


Figure 3. Percent frequency of vegetation, KA-16A, Blue Basin Allotment, 2005 & 2011.

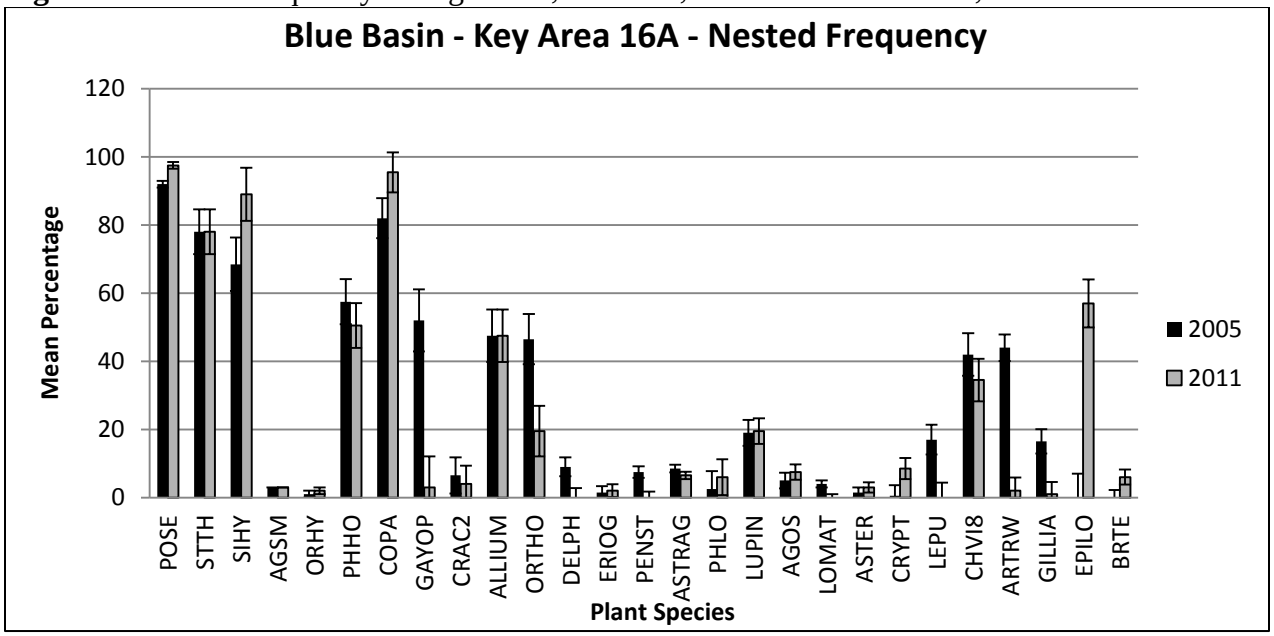
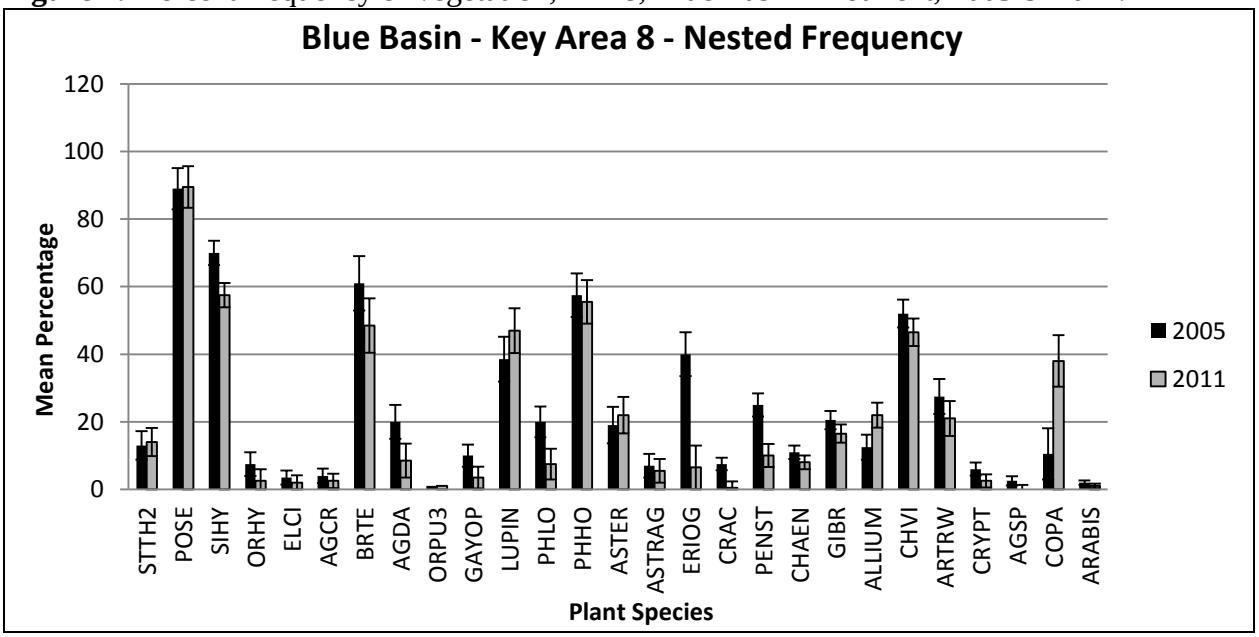


Figure 4. Percent frequency of vegetation, KA-8, Blue Basin Allotment, 2005 & 2011.



Since the 2005, all of the upland long term key areas on the allotment have been burned by wildfires except for key area 8. Statistically significant changes in the plant community from a climax sagebrush plant community to an early seral grassland dominated plant community have occurred at key areas 7 and 16A (Figures 2 and 3). For unburned key area 8 (Figure 4), statistically significant increases in the amount of grasses and forbs, and overall biodiversity in the plant community occurred between 2005 and 2008. There were also notable decreases in Cheatgrass percentages. The increase in grasses and forbs may be due to the high amount of precipitation received in 2010/2011 and/or the rotational grazing system implemented after the 2007 Red House Fire. Plant codes identification can be found in Appendix D.

A.5. Upland Photographic Data

Upland photographic data has been collected on the Blue Basin Allotment from 1968 to 2012. These data are shown in Figures 5-12 below.

Figure 5. Photos of the Blue Basin Allotment, Airport Pasture. Dates: A) 1994, B) 1999.

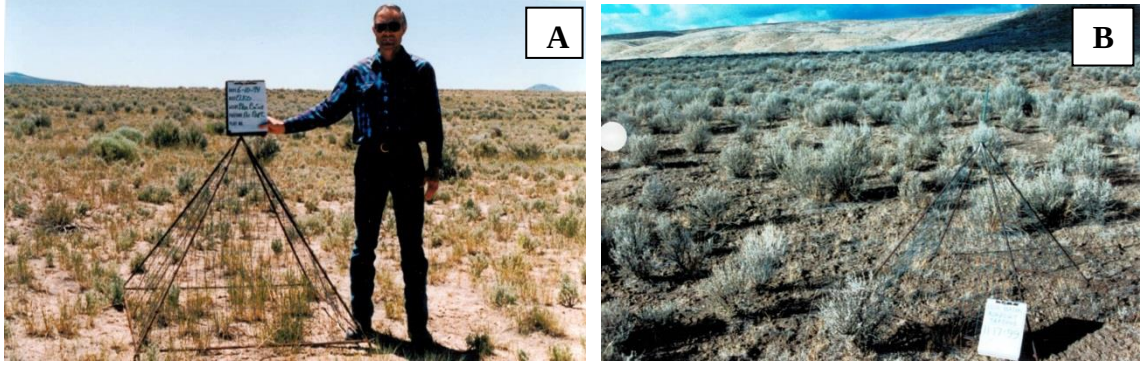


Figure 6. Photos of the Blue Basin Allotment, East Avenal Pasture. Dates: A) 1993, B) 1994, C) 1999.

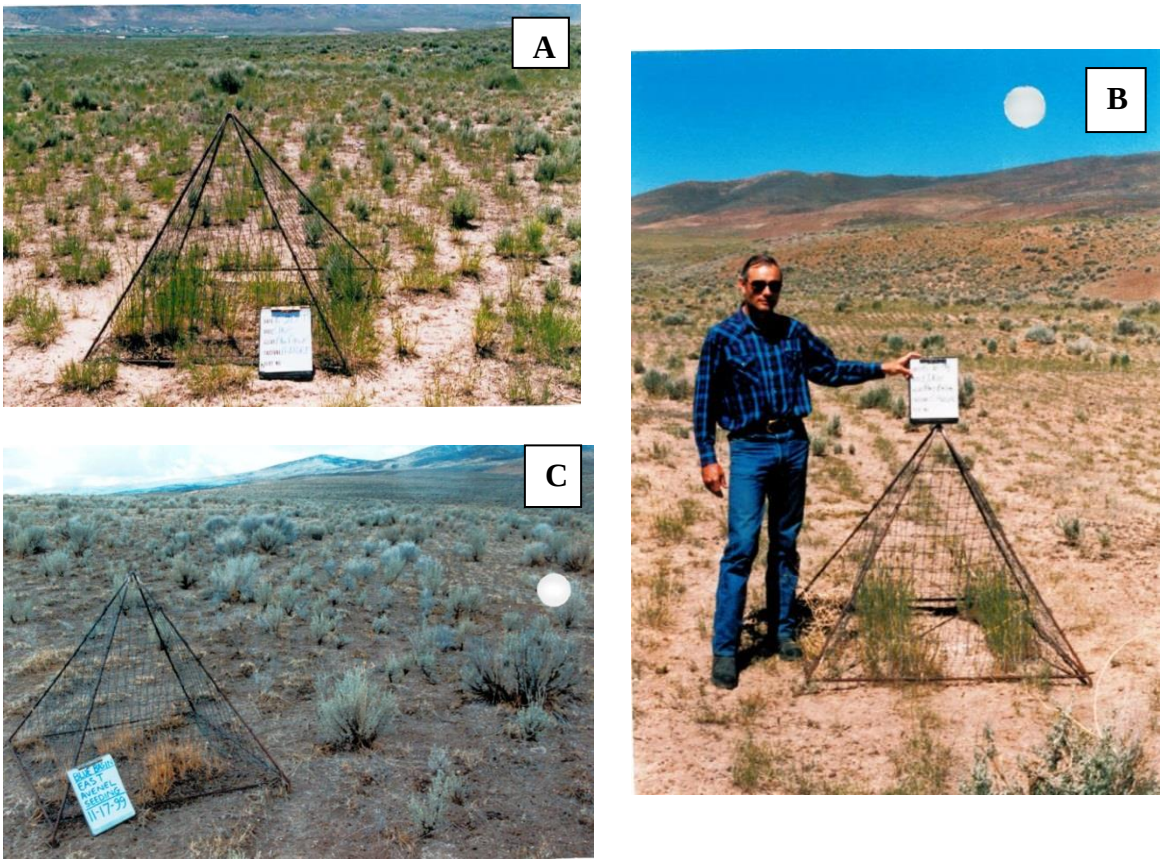


Figure 7. Photos of the Blue Basin Allotment, North Lone Mountain Pasture, 2012.

Figure 8. Photos of the Blue Basin Allotment, Louse Creek Pasture. Dates: A) 1992, B) 1993.

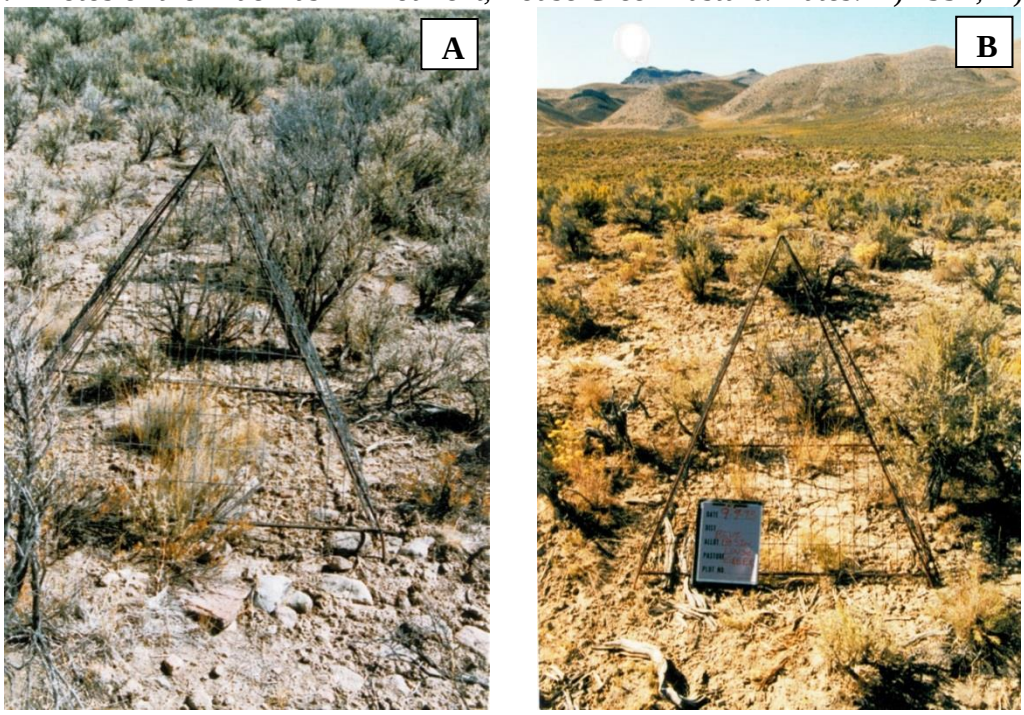


Figure 9. Photos of the Blue Basin Allotment, Stinson Pasture. Dates: A) 1992, B) 2012.

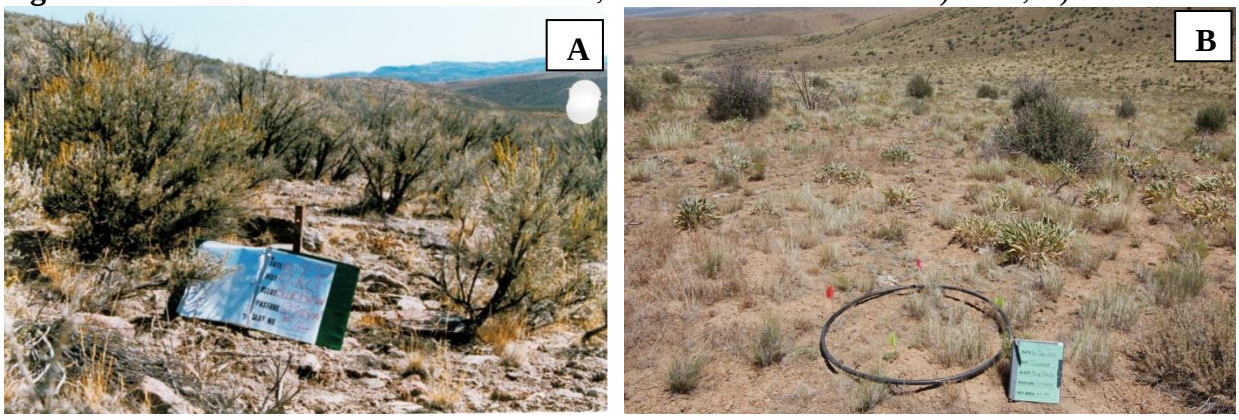


Figure 10. Photos of the Blue Basin Allotment, Stinson Riparian Pasture, 2012.

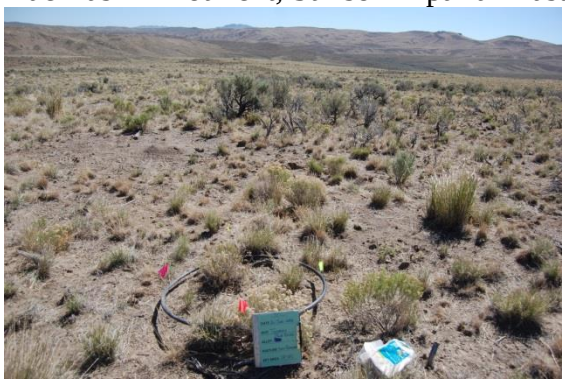


Figure 11. Photos of the Blue Basin Allotment, Susie Pasture, 2012.

Figure 12. Photos of the Blue Basin Allotment, 1968.

A.6. Cover

Foliar and ground cover were measured at key areas 7, 8, and 16A in 2005 and 2011 using the point cover method, in which cover data were collected at 600 systematically located points within a key area (Swanson et al. 2006). This method quantifies soil cover, including vegetation, litter, rock, and biotic crusts. These variables can be related to wind and water erosion, and soil infiltration and percolation, and can be used to determine the ability of the site to resist and recover from degradation (Herrick et al., 2005). Live vegetation point cover data at each key

area was interpreted within a general rangeland health framework and then compared to ESD data. These results are summarized in Figures 13-15.

Figure 13. Cover values for KA-07 in 2005 & 2011. The solid line represents the range in live cover estimated for the key area, based on ecological site (20%-35%).

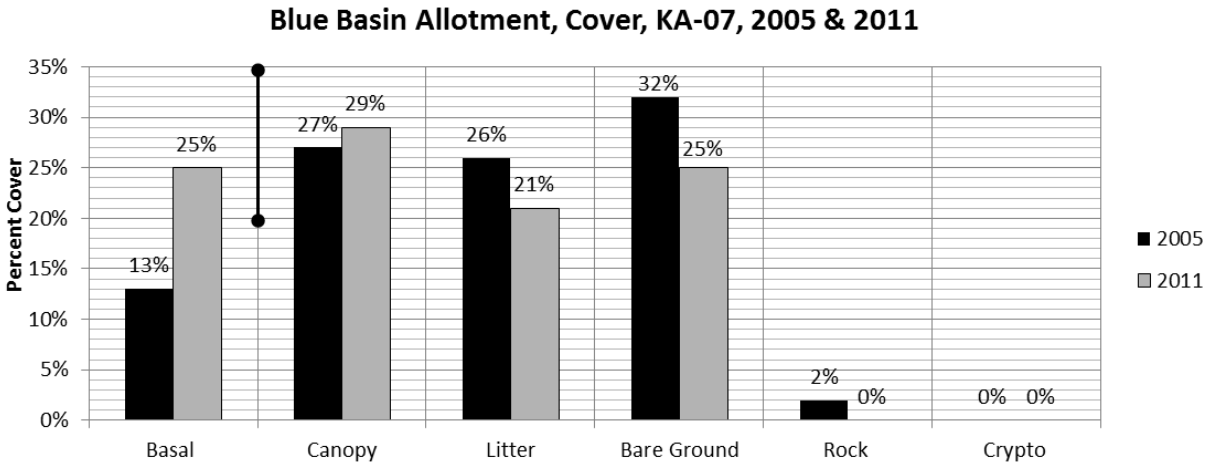


Figure 14. Cover values for KA-08 in 2005 & 2011. The solid line represents the range in live cover estimated for the key area, based on ecological site (30%-40%).

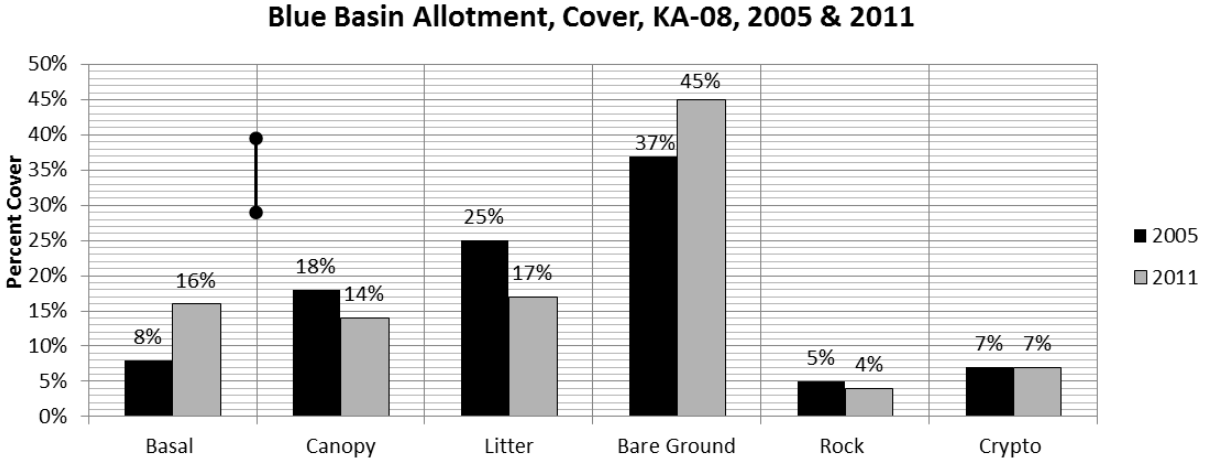
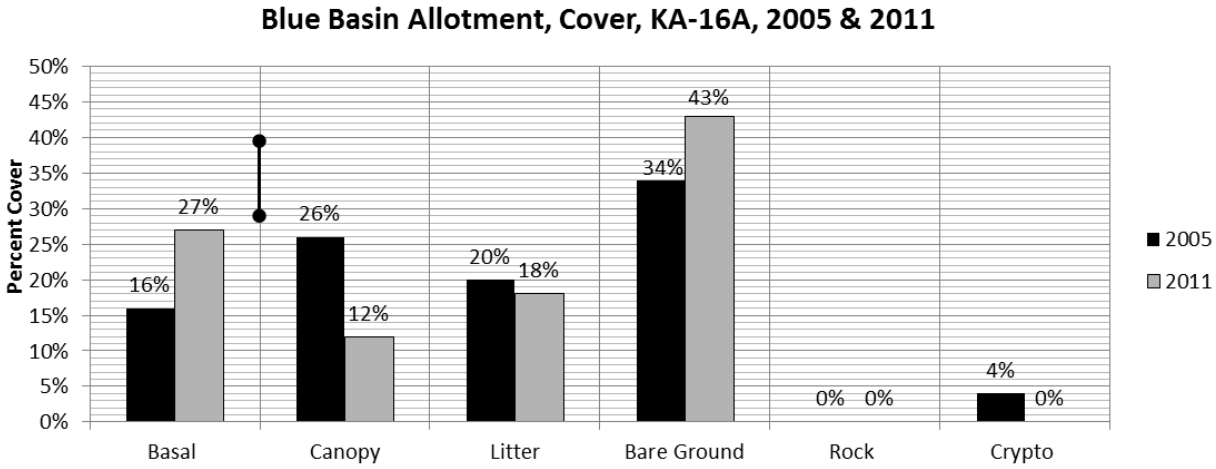


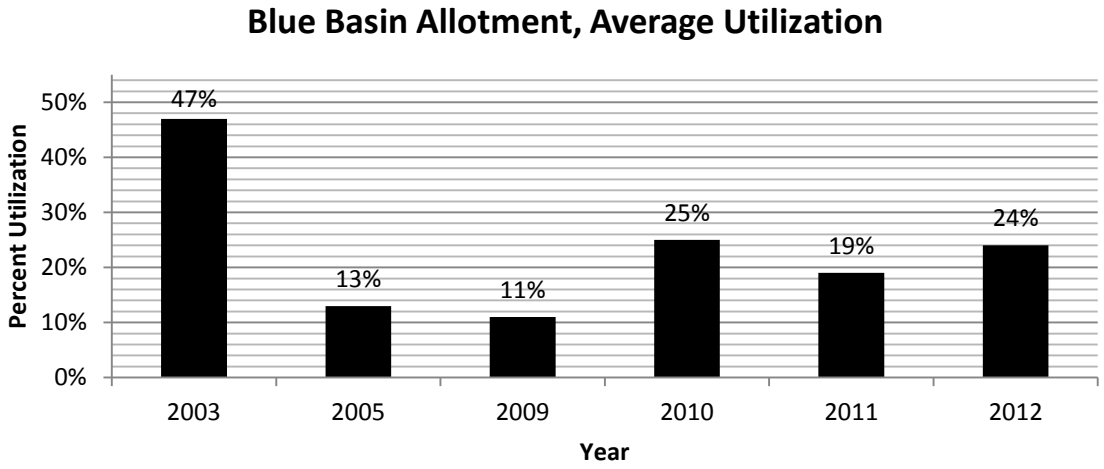
Figure 15. Cover values for KA-16A in 2005 & 2011. The solid line represents the range in live cover estimated for the key area, based on ecological site (30%-40%).



A.7. Utilization

Utilization is an estimation of the proportion of annual production consumed or destroyed by livestock or wildlife (BLM 1999b; Swanson et al. 2006). A total average utilization across the Blue Basin Allotment in 2003, 2005, 2009, 2010, 2011, and 2012 are shown in Figure 16 below.

Figure 16. Average key species utilization for Blue Basin Allotment, displayed in percentages.



A.8. Use Pattern Mapping

A use pattern map details how grazing utilization on key forage grass species was distributed throughout the allotment. Use pattern mapping was completed for the Blue Basin Allotment in 2010, 2011, and 2012. The use pattern maps show moderate utilization in most areas of the allotment. Use pattern maps can be found in Figures 17-19 below.

Figure 17. Use Pattern Mapping for the Blue Basin Allotment, 2010.

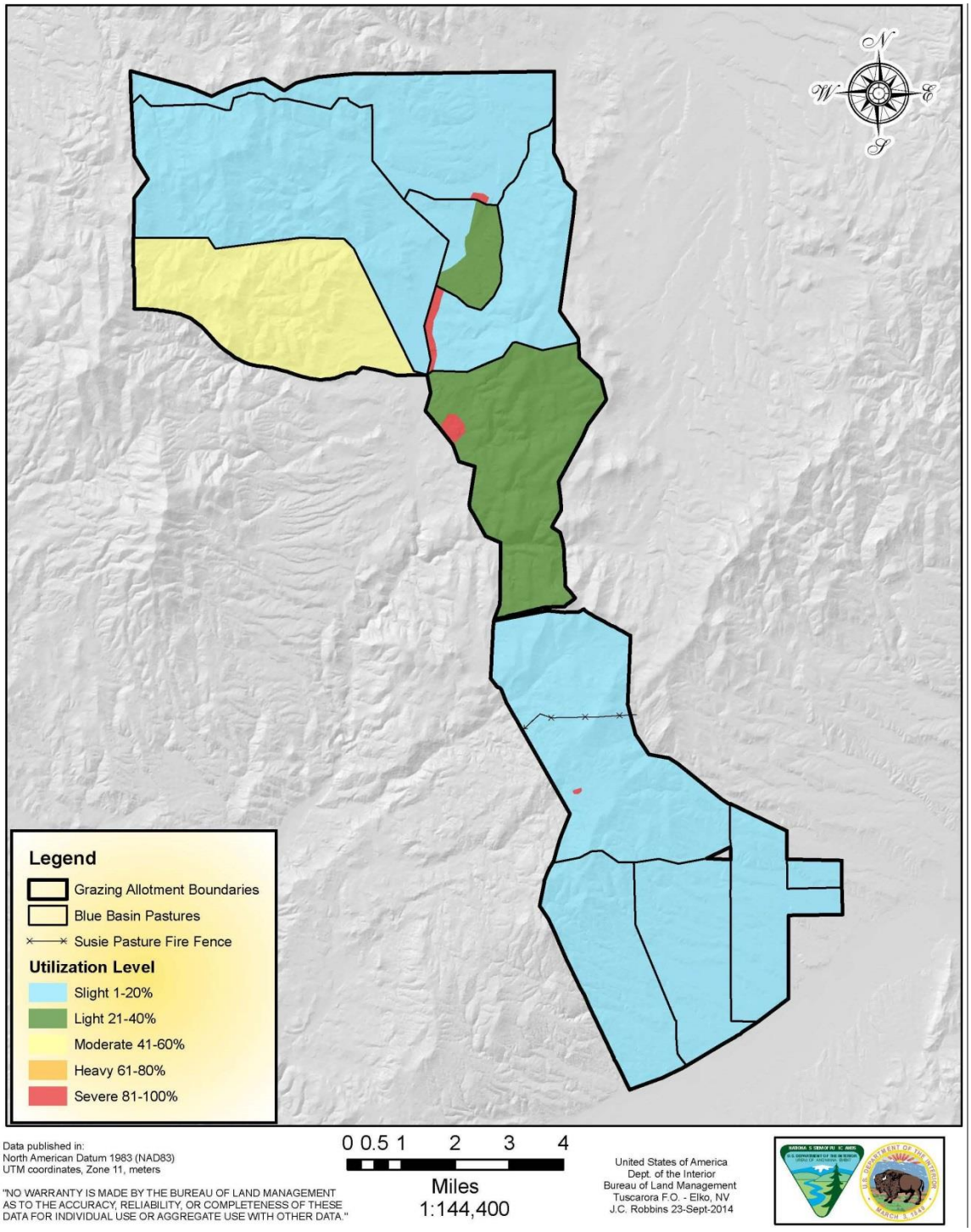


Figure 18. Use Pattern Mapping for the Blue Basin Allotment, 2011.

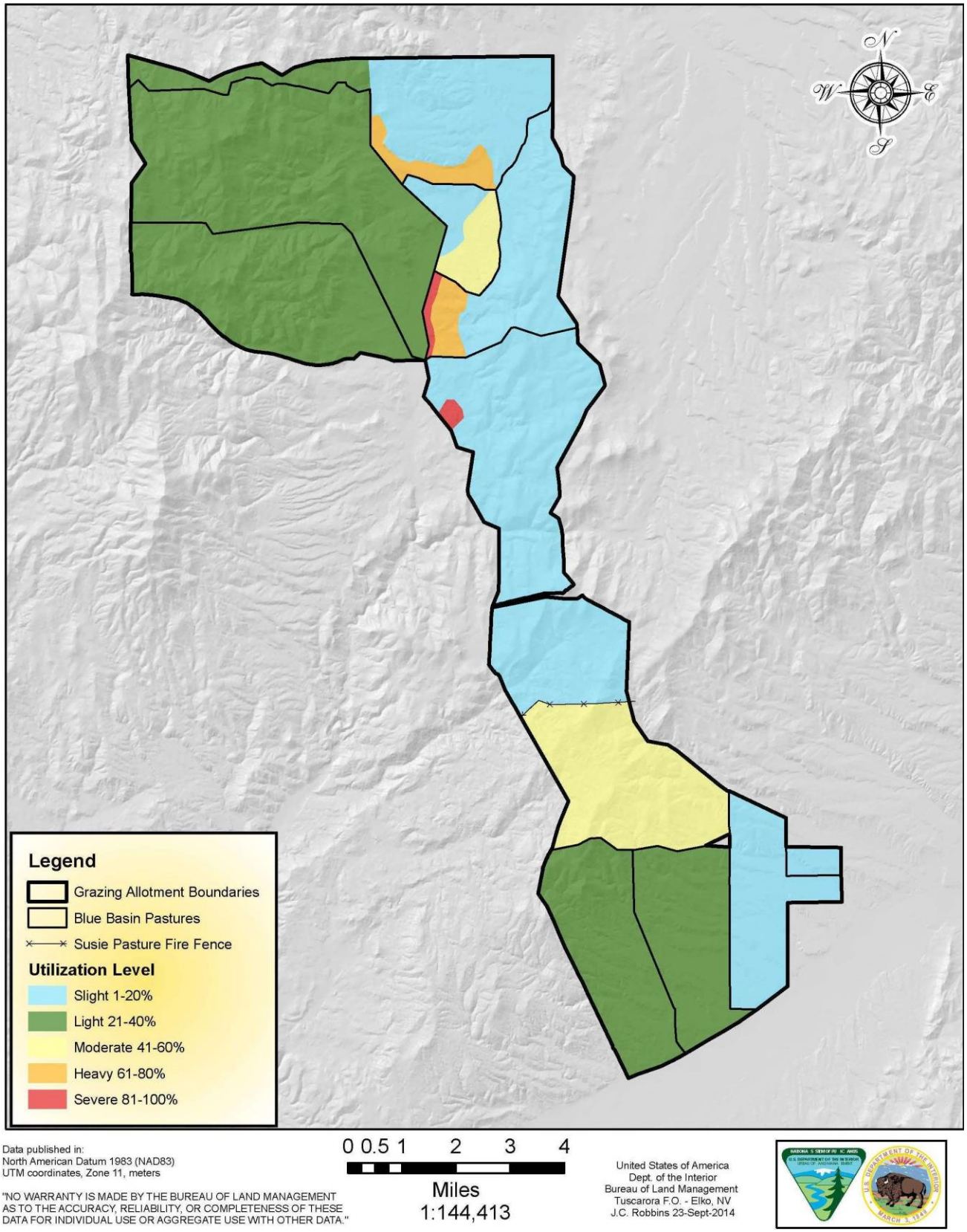
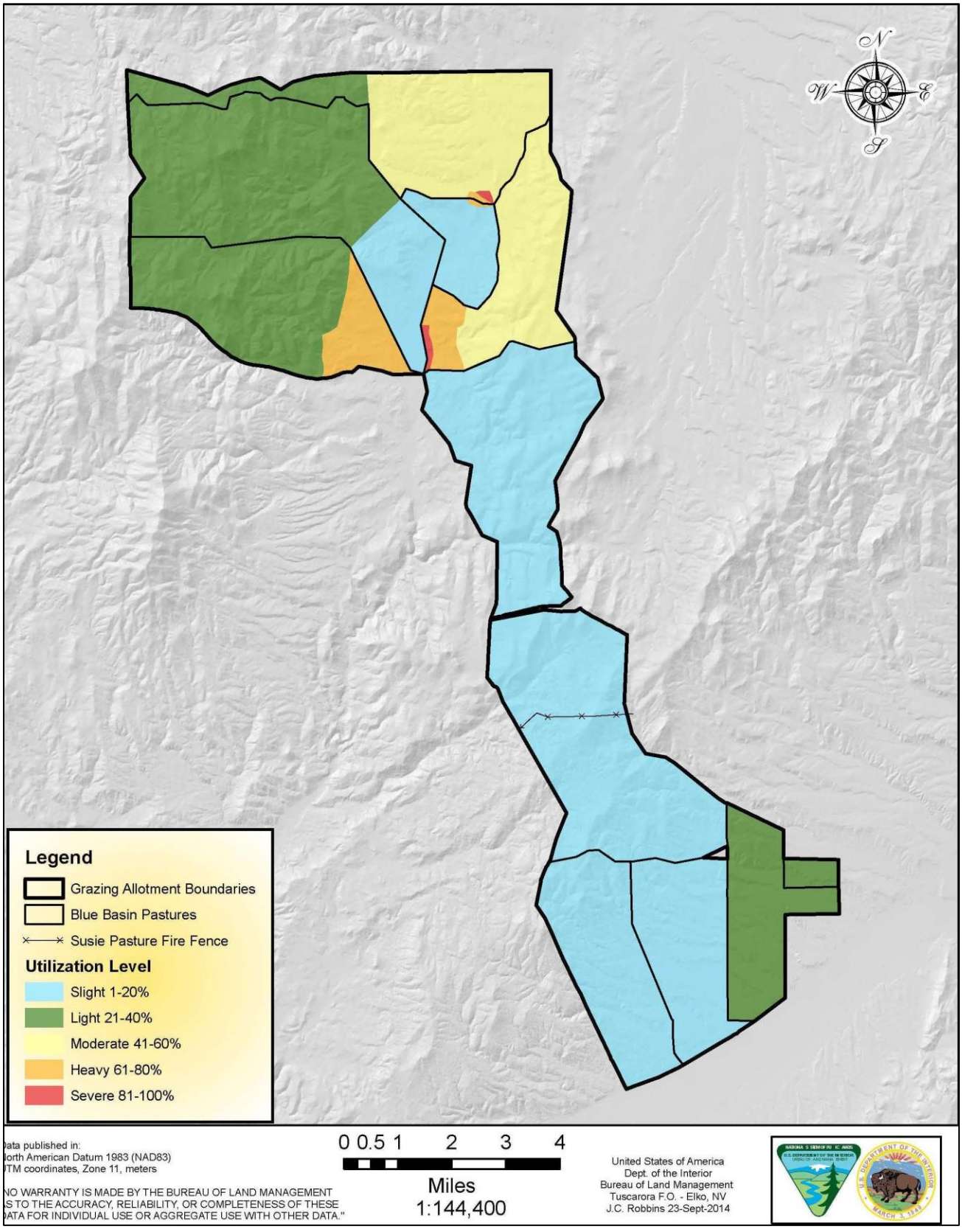


Figure 19. Use Pattern Mapping for the Blue Basin Allotment, 2012.



A.9. Rangeland Health Evaluation and Soil Stability Test

Indicators of Rangeland Health data were collected on the Blue Basin Allotment in 2011at Key Areas DW-04-05 and 16A. Indicators of Rangeland Health assess factors in regard to soil and site stability, hydrologic function, and biotic integrity of the area, then are compared to the ESD reference sheets for the ecological site. A summary of these data can be found below in Table 4 & 5.

Table 4. Indicators of Rangeland Health, Key Area DW-04-05, 2011.

Indicator	Extreme to Total	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills					X
2. Water-flow patterns					X
3. Pedestals and/or terracettes					X
4. Bare ground **38** %					X
5. Gullies					X
6. Wind-scoured, blowouts, and/or deposition areas					X
7. Litter movement					X
8. Soil surface resistance to erosion					X
9. Soil surface loss or degradation					X
10. Plant community comp. and distribution relative to infiltration					X
11. Compaction layer					X
12. Functional/structural groups		X			
13. Plant mortality/decadence					X
14. Litter amount					X
15. Annual production		X			
16. Invasive plants		X			
17. Reproductive capability of perennial plants					X
Soil and site stability rating:	**0**	**0**	**0**	**0**	**10**
Hydrologic function rating:	**0**	**0**	**0**	**0**	**10**
Biotic integrity rating:	**0**	**3**	**0**	**0**	**6**

Soil and site stability, as well as, hydrologic function for this location are rated as none to slight deviation from expected due to assessments and observation from the collecting cadre. In addition, a moderate departure from what is to be expected for biotic integrity was recorded due to invasive species that were common and a change in functional structural groups.

Figure 5. Indicators of Rangeland Health, Key Area 16A, 2011.

Indicator	Extreme to Total	Moderate to Extreme	Moderate	Slight to Moderate	None to Slight
1. Rills					X
2. Water-flow patterns				X	
3. Pedestals and/or terracettes				X	
4. Bare ground **36** %					X
5. Gullies					X
6. Wind-scoured, blowouts, and/or deposition areas					X
7. Litter movement					X
8. Soil surface resistance to erosion					X
9. Soil surface loss or degradation					X
10. Plant community comp. and distribution relative to infiltration				X	
11. Compaction layer					X
12. Functional/structural groups				X	
13. Plant mortality/decadence					X
14. Litter amount				X	
15. Annual production			X		
16. Invasive plants				X	
17. Reproductive capability of perennial plants					X
Soil and site stability rating:	**0**	**0**	**0**	**2**	**8**
Hydrologic function rating:	**0**	**0**	**0**	**4**	**6**
Biotic integrity rating:	**0**	**0**	**1**	**3**	**5**

Soil and site stability was rated as "none to slight" deviation from expected by assessments and observations from the collecting cadre. In addition, a moderate departure from what is to be expected for hydrologic function and biotic integrity was recorded due to infiltration being reduced, shown by evident water flow patterns, and invasive species that were common and a change is functional structural groups.

A.10. Riparian Monitoring Data and Assessments

Information on condition and trend of riparian habitats has been collected on the Blue Basin Allotment over a period of more than 30 years. Data include stream surveys (BLM 2002), proper functioning condition assessments (Prichard et al. 1998, Prichard et al. 1999, Revised 2003)[1] and measurements of streambank trampling and utilization of woody and herbaceous riparian plants by livestock.

In recent years, permittees have made voluntary changes in grazing practices which have led to improvement in some of these important riparian habitats. Response of riparian areas has varied by pasture and by effectiveness of grazing prescriptions; therefore, results are described by

[1] A riparian area is considered to be in proper functioning condition (PFC) when adequate vegetation, landform, or large woody debris is present to dissipate energy, filter sediment, capture and store water; develop stabilizing root masses; and develop diverse habitat characteristics leading to increased biodiversity. A riparian area is described as functional-at-risk if an existing soil, water or vegetation attribute makes them susceptible to degradation (Prichard et al. 1998; Prichard 1999, Revised 2003).

pasture in the following sections.[2] Information is for public lands only. Pastures with no appreciable riparian habitats on public lands include South Lone Mountain, East and West Avenel, and the Airport Pasture. Monitoring and assessment locations are shown in Appendix B, Map 2.

Stinson Riparian Pasture

The upper reaches of Susie Creek and the lower reaches of tributary, Blue Basin Creek, occur within the Stinson Riparian Pasture. Portions of both streams in the pasture are perennial.

Prior to the 2006 Basco Fire, most of the upper reaches of Susie Creek were included within an exclosure constructed in 1986, while the lower portion of Blue Basin Creek was part of the Stinson Pasture. The exclosure was frequently breached as a result of heavy livestock pressure at water crossing and was essentially nonfunctional. In 2006, the exclosure was destroyed by fire and in 2007 the Stinson Riparian Pasture was constructed resulting in approximately four miles of Susie Creek and three miles of Blue Basin Creek being incorporated into a more functional management unit.

Stream survey data for upper Susie Creek show conditions were poor prior to construction of the Stinson Riparian Pasture (Refer to Section A.13, Figure 21, Photo A). Streambanks were generally unstable and only partially vegetated with scattered amounts of sedges and rushes. By 2008, riparian habitat conditions were considered good and the entire reach was considered to be in proper functioning condition. Although riparian habitat conditions declined slightly by 2011, streambanks remain stable and well vegetated (Section A.13, Figure 21, Photo B). The rating of functional-at-risk in 2011 is the result of a headcut in the lower end of the reach (a headcut in this area was also described in 2005). Data summaries for Upper Susie Creek are below in Table 6.

Table 6. Monitoring summary for Upper Susie Creek, 1978-2011.[1]

Year	Riparian Condition Class (% Optimum)[2]	Proper Functioning Condition Assessment[3]
1978	41 (poor)	No data
1989	40 (poor)	No data
1994	46 (poor)	No data
2005	No data	FAR, trend down
2008	68 (good)	PFC[3]
2011	63 (fair to good)	FAR[3], trend not apparent

[1]Based on data from stream survey station S-8.

[2]Average of streambank cover and streambank stability. Optimum is considered to represent totally stable streambanks bordered by dense trees or tall shrubs (BLM 2002).

[3]PFC=Proper Functioning Condition; FAR=Functional-at-Risk (Prichard et al. 1998).

Riparian habitat conditions are fair to good for the perennial portion of Blue Basin Creek within the Stinson Riparian Pasture (Table 7). In 2011, this reach was rated as being in PFC, representing an improvement since over earlier assessments in 1999 and 2008. Although flow and floodplain width is limited for this small incised drainage, fire closure rest and limited

[2] Rotational grazing patterns by pasture are on file with Elko District, BLM.

prescriptive grazing have resulted in a well vegetated floodplain and good growth and establishment of willows (Section A.13, Figure 22).

Table 7. Monitoring and assessment summary for Blue Basin Creek, 2008-2011.[1]

Year	Riparian Condition Class (% Optimum)	Proper Functioning Condition Assessment[2]
1999	No data	NF
2008	No data	FAR, trend up
2011	62.5 (fair to good)	PFC

[1]Based on data from stream survey station S-1.
[2]PFC=Proper Functioning Condition; FAR=Functional-at-Risk; NF=Nonfunctional (Prichard et al. 1998).

A spring complex located adjacent to Susie Creek was rated as being in PFC in 2005. Observations in 2011 indicate the complex remains very stable and well vegetated.

Stinson Pasture

Riparian habitat in the Stinson Pasture includes a number of scattered seeps and springs and about one mile of Singletree Creek. Singletree Creek is primarily intermittent and supports a series of springs as well as several aspen stands. Monitoring data show that with the exception of 2008, lentic riparian areas in this pasture have been rated as being either functioning-at-risk or nonfunctional (Table 8). Conditions in 2008 are representative of two years of fire closure rest. In 2010, impacts from livestock including trampling and compaction of soils as well as heavy utilization of riparian vegetation were determined to be the primary cause of failure of lentic areas to achieve PFC.

Since 2010, much of the lentic areas impacted by livestock in the Stinson Pasture including the Singletree drainage have been fenced. In 2011, three exclosures were constructed around aspen stands burned by the 2006 Basco Fire for the purpose of promoting and protecting post-fire sucker regeneration.

Table 8. Functioning condition assessments for Stinson Pasture, Lentic, 2005-2010.[1]

Spring Number	Year		
	2005	2008	2010
31	No data	PFC (Singletree drainage)	FAR, trend not apparent to NF (Singletree drainage)
32	No data		
33	FAR, trend not apparent		
34	*		
35	FAR, trend down		
36	FAR, trend down	No data	FAR, trend not apparent

[1]FAR=Functional-at-risk; NF=Nonfunctional; PFC=Proper Functioning Condition (Prichard et al. 1998).
*Data may not be valid.

Louse Pasture

Riparian habitat in the Louse Pasture includes about 1.2 miles of Blue Basin Creek as well as numerous seeps and springs including some of which support aspen.

Although data are limited for Blue Basin Creek, surveys conducted in 2011 show riparian condition class (average of bank cover and bank stability) is fair (59% of optimum) and that this reach is in PFC.

Lentic functioning assessments conducted in 2005 and 2010 indicate that most sites are either functioning-at-risk or nonfunctional (Table 9). However, two sites rated as being nonfunctional in 2005 were rated as being functional with an upward trend in 2010. Long-term impacts from livestock including trampling and compaction of soils as well as heavy utilization of riparian vegetation were determined to be the primary cause of failure of lentic areas to achieve PFC.

Table 9. Functioning condition assessments for Louse Pasture, Lentic, 2005-2010.[1]

Spring Number	Year	
	2005	**2010**
15	NF	NF
16	FAR, trend down	FAR, trend down
17	FAR, trend down	FAR, trend down
20	FAR, trend down	No data
21	FAR, trend down	No data
22	FAR, trend not apparent	No data
23	FAR, trend down	FAR, trend not apparent
24	FAR, trend down	No data
25	FAR, trend down	No data
26	NF	FAR, trend upward
27	FAR, trend down	No data
28	FAR, trend down	No data
29	FAR, trend not apparent	FAR, trend not apparent
30	Nonfunctional	FAR, trend upward

[1]FAR=Functional-at-risk; NF=Nonfunctional (Prichard et al. 1998).

North Lone Mountain Pasture

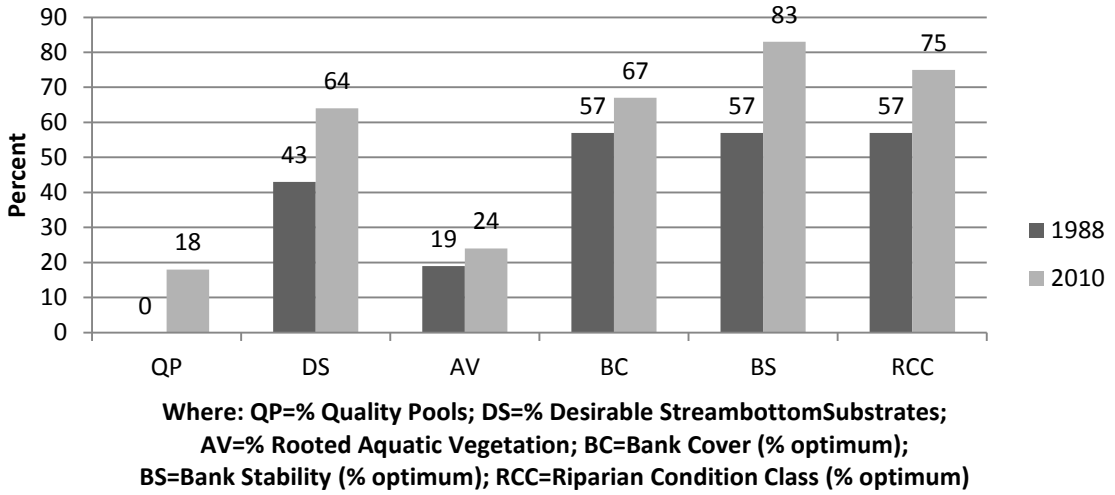
Riparian habitat on public lands is limited to a fairly large mesic meadow complex along approximately 0.5 miles of Cold Creek. In 2008, this reach was rated as being in PFC following two years fire closure rest from grazing. This area was again rated as being in PFC in 2014. Although past grazing practices likely contributed to formation of gully and subsequent reduction in the former extent of the meadow complex, recent management efforts have resulted in formerly incised channel becoming stable and well vegetated.

Adobe Pasture

The primary riparian habitat in the Adobe Pasture includes about 1.2 miles of Adobe Creek and several springs associated with the stream drainage. Adobe Creek represents a small step pool channel boarded by aspen and willow. Paiute sculpin *(Cottus beldingi*) were described as being present in this stream in 1988 (BLM stream survey files). This is significant as Paiute sculpin require clear, cold water and are almost always associated with trout (Sigler and Sigler 1987). Although trout are not currently known to inhabit Adobe Creek, the presence of sculpin suggests this stream may have potential to support Lahontan cutthroat trout if this species is reintroduced into the Susie Creek basin.

Surveys conducted by BLM show substantial improvement in key stream and riparian habitat parameters over time on Adobe Creek (Section A.13, Figure 23, photos A-C). Streambanks are becoming increasingly stable and vegetated while stream bottom substrate composition is shifting from fine sediments to gravels and rubbles. The riparian condition class is rated as good to excellent (75 % of optimum). Quality pools for fish are starting to develop; while increases in rooted aquatic vegetation (primarily water crowfoot) act to trap sediment and result in more cover and food for fish and aquatic invertebrates (Figure 20).

Figure 20. Changes in key stream and riparian habitat parameters for Adobe Creek, S-2 to S-4, 1988-2010.



Functioning condition assessments show improvement from a rating of nonfunctional in 2005 to a rating of PFC in 2011 (Table 10). Photographic comparisons for the years 1988, 2006 and 2011 illustrate development of a much more functional vegetated floodplain including a substantial narrowing of the stream channel. There is evidence of nutrient enrichment in the stream (abundance of snails and algae) possibly as a result of upstream agricultural practices on private lands.

Table 10. Summary of functioning condition assessments for Adobe Creek, 2005-2011.

Year	Functioning Condition[1]
2005	NF
2010	FAR, trend upward
2011	PFC

[1]PFC=Proper Functioning Condition; FAR=Functional-at-risk; NF=Nonfunctional (Prichard et al. 1998).

Functioning condition assessments are available for a single spring (#12) located near the Adobe Creek drainage (Appendix B, Map2). The spring was rated as functional-at-risk with no apparent trend in 2005 and PFC in 2011. Photographic comparisons show improvement in vegetative conditions and functionality over time (Section A.13, Figure 24, photos A and B).

North Susie Pasture
Riparian habitat in the North Susie Pasture includes Middle Susie Creek, an intermittent drainage, and several seeps and springs mostly located along the drainage channel.

Middle Susie Creek was rated as nonfunctional in 2006 and functional-at-risk with no apparent trend in 2011. Photographic comparisons indicate filling in and colonization of the floodplain by herbaceous vegetation as well as some increase in willow regeneration (Section A.12, Figure 25, photos A and B).

Functioning condition assessments completed for lentic riparian areas are variable, but suggest most seeps and springs were functioning-at-risk in 2005, with a downward trend (Table 11). Recent data are incomplete for more recent years but data for 2010 indicate improvement at some sites. Where standards for achieving proper functioning condition have not been met, livestock are the causal factor.

Table 11. Functioning condition assessments for North Susie Pasture, Lentic, 2005-2011.

Spring Number Map 2	Year		
	2005	**2010**	**2011**
5	FAR, trend down	PFC	No data
6	FAR, trend down	No data	
7	FAR, trend down	No data	
8	FAR, trend down	PFC	
9	PFC	No data	
10	PFC	PFC	
37	No data	FAR, trend down	FAR, trend down
38	No data	PFC	FAR, trend not apparent

[1]FAR=Functional-at-risk; NF=Nonfunctional; PFC=Proper Functioning Condition (Prichard et al. 1998).

South Susie Pasture
Riparian habitat is limited to several seeps and springs. Assessment were completed on spring number 2, 3, and 4 (See Appendix B, Map 2). Several of these occur along an intermittent drainage that appears to have supported more mesic conditions in the past. Spring number 2 includes an old collection box which may have the effect of reducing water availability to the downstream meadow area.

Results of recent assessments indicate only spring number 2 is continuing to function as a riparian area. Although this site was rated as being functional-at-risk in 2005 and 2010 with an upward to non-apparent trend, the most recent assessment in 2011 shows the majority of the spring system is in PFC.

Riparian functions are not clearly evident at spring numbers 3 and 4. Although these sites were assessed as being functional-at-risk with a downward trend or nonfunctional, respectively, in 2005, observations in 2014 indicate a loss or absence of lentic attributes. Capability and potential for both sites is reduced by road impacts, vehicle compaction, drought and past grazing

influences. In 2014, spring number 3 was rated as being nonfunctional, while spring number 4 was determined to be functioning more as an upland site than a lentic site. Current livestock grazing practices are not clearly the causal factor in nonattainment of the standard at either location.

A.11. Livestock Impact Studies (Riparian)

Livestock impact monitoring was completed for priority riparian habitats in 2006, 2010, 2011, and 2012 (Table 12). Generally, data show reduced impacts in recent years in response to application of prescriptive grazing practices. Stubble heights for riparian herbaceous vegetation as well as utilization of aspen and willow were lower in 2010 and 2011 than in 2006. Although use levels increased in 2012, severe drought conditions resulted in heavy to severe impacts to riparian areas from livestock throughout the district even in areas grazed conservatively.

Table 12. Livestock impact monitoring, North Susie, Adobe, & Stinson Riparian, 2006-2012.

Creek	Location	Year[3]	Avg. Riparian Herbaceous Stubble Height (in)[1]	Willow utilization %[2]	Aspen utilization %	Streambank alteration by livestock
North Susie Pasture						
Middle Susie	Stop 1	2010	none to slight	none to slight	NA	Slight
		2011	**2.76**	**14.6**	NA	**11-21%**
	S-1	2010	7.2	3.5 – 3.9	NA	<5%
		2011	**4.5**	**10**	NA	**20%**
Adobe Pasture						
Adobe Creek	Btw S-1 and S-2	2010	Slight (<20%), 8”	Slight-light (20%)	Slight-light (20%)	No data
	S-3	2006	3.6	50	NA	None to slight
		2010	12.0	2.5	2.0	2-3%
Stinson Riparian Pasture						
Upper Susie	Stinson Riparian S-9	2010	No use	NA	NA	none
		2011	12.1	NA	NA	**21-40%**
Blue Basin	Stinson Riparian	2010	No use	None to slight	NA	<5%
		2011	6.49	NA	NA	**21-40%**

[1]Techniques from BLM 1996.
[2]Techniques are from the Key Forage Plant Method (Nevada Rangeland Task Group 1984) where Slight = 1-20%, Light = 21-40%, Moderate = 61-80%, Severe = 81-100%
[3]2006 data from 6/26, 2010 data from 7/1, 2011 data from 9/28 or 9/29

A.12. Water Quality Data

State water quality standards outlined in Nevada Administrative Code (NAC) 445A apply to Susie Creek. Susie Creek and associated side drainages have not been designated, but standards and beneficial uses designated for the Humboldt River between Osino and Palisade apply under the tributary rule. For the Humboldt River between Osino and Palisade, numeric standards have been established for a variety of beneficial uses including aquatic life (warm-water fishery), irrigation, livestock, municipal, and industrial.

Seep and spring habitats within the Blue Basin Allotment have not been designated and as such, are addressed under narrative standards. The narrative standards contained in NAC 445A.121 apply to all surface waters of the state and require waters to be free from various pollutants in sufficient levels so as to not be unsightly, interfere with any beneficial uses, create a public nuisance, be toxic to human, animal, plant, or aquatic life, or have any adverse effects.

Water quality data for the Blue Basin Allotment include information collected at springs during the 2005 lentic PFC assessment and on Susie and Adobe Creeks in 2012.

Data collected at selected stream survey stations for Susie and Adobe Creeks (refer to Appendix B, Map 2) in June and July of 2012 indicate water quality parameters were below numeric standards established for the Humboldt River, with the exception of total phosphorus (Table 13). Values for phosphorus at S-9 on Susie Creek and S-3 on Adobe Creek were nearly three times the seasonal average of ≤ 0.1 mg/l established for the Humboldt River downstream. High phosphorus was not observed on Susie Creek at a sampling site located in the McKinnley FFR Allotment approximately two miles downstream from the Blue Basin Allotment. Total dissolved solids (TDS) were also high for Susie Creek at stream survey station S-9.

Sampled areas on Susie and Adobe Creeks occur downstream from private pastures. In the case of Adobe Creek, this stream originates from springs located just below a hayfield. High levels of algae and an abundance of snails have been documented for Adobe Creek during stream surveys supporting an assessment of high nutrient loads. It is important to note that these data are informational only; exceedance of a standard cannot be assumed based on one point in time sampling.

Table 13. Water quality summary, Susie Creek and Adobe Creek, 2012.

Sample Location (refer to Map 2)	**pH**	**Water Quality Parameter**					
		Conductivity (µmhos/cm)	**Water Temp (^{0}C)**	**Total Nitrogen (mg/l)**	**NO3 (mg/l)**	**Total Phosphorus (mg/l)**	**Total Dissolved Solids (mg/l)**
Susie Creek (McKinnley FFR Allotment)[1]	8.79	525	22.3	0.076	<0.01	0.032	370
Susie Creek (S-9)	8.24	760	14.4	0.280	0.026	0.300**	500*
Adobe Creek (S-3)	8.21	440	6.7	0.290	0.059	0.310**	270

[1]Sampling site located approximately two miles downstream from Blue Basin Allotment.
*Downstream Humboldt River Standard = Average value of ≤ 500 mg/l.
**Downstream Humboldt River Standard = April to November seasonal average is ≤ 0.1

A.13. Riparian Photographic Data

Figure 21. Susie Creek, stream survey station S-9, T-1, downstream. A) 1989 B) 2012.

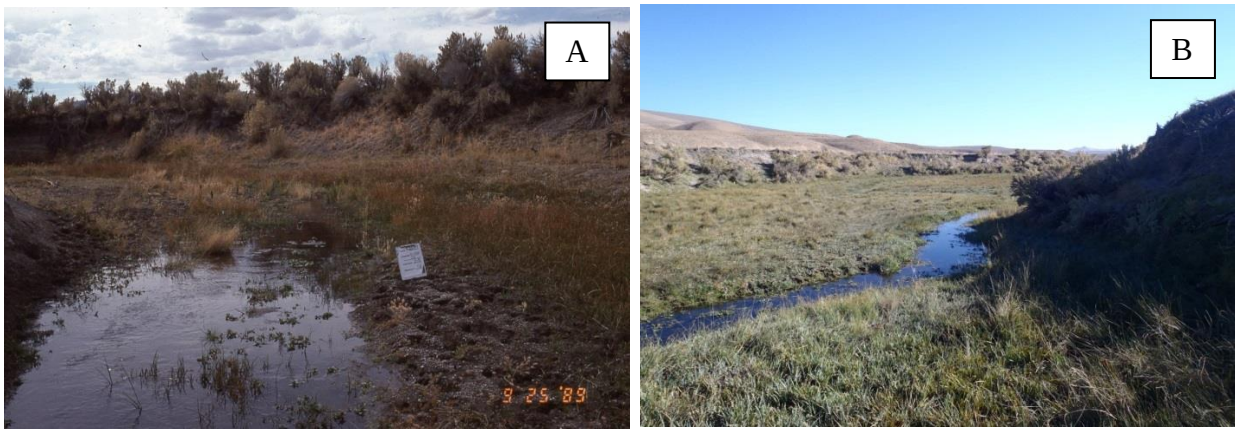


Figure 22. Blue Basin Creek, Stinson Riparian Pasture, 2011.

Figure 23. Adobe Creek, survey station S-3, T-1, downstream, A) 1988 B) 2006 C) 2012.

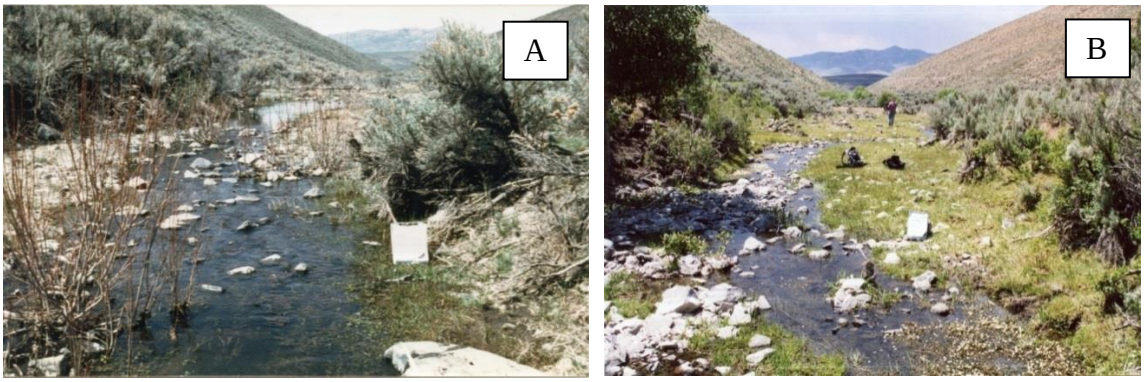


Figure 24. Blue Basin lentic site #12, A) 2005 B) 2011.

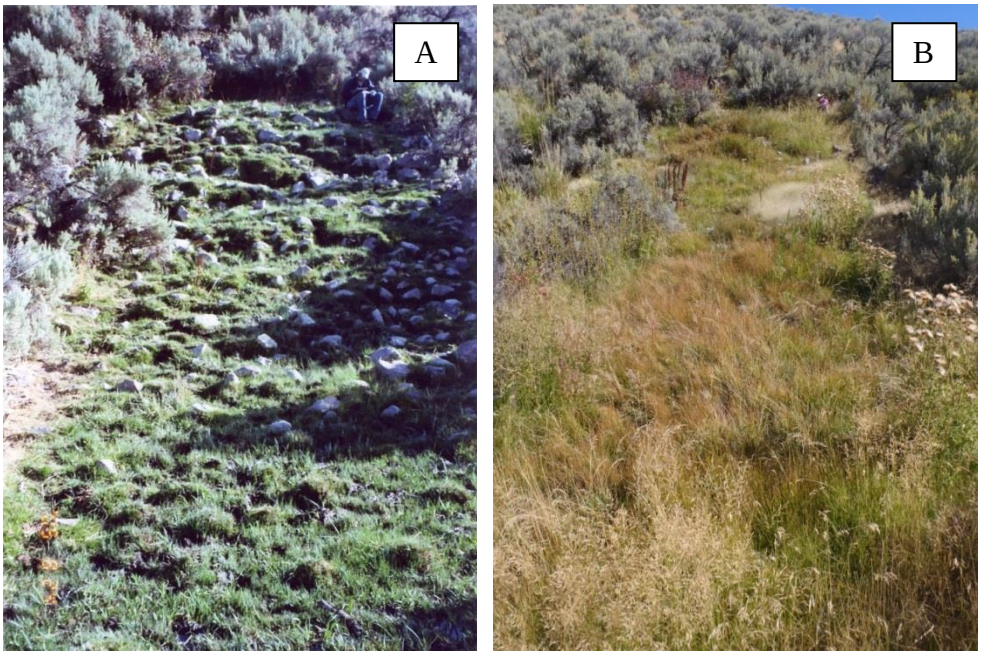
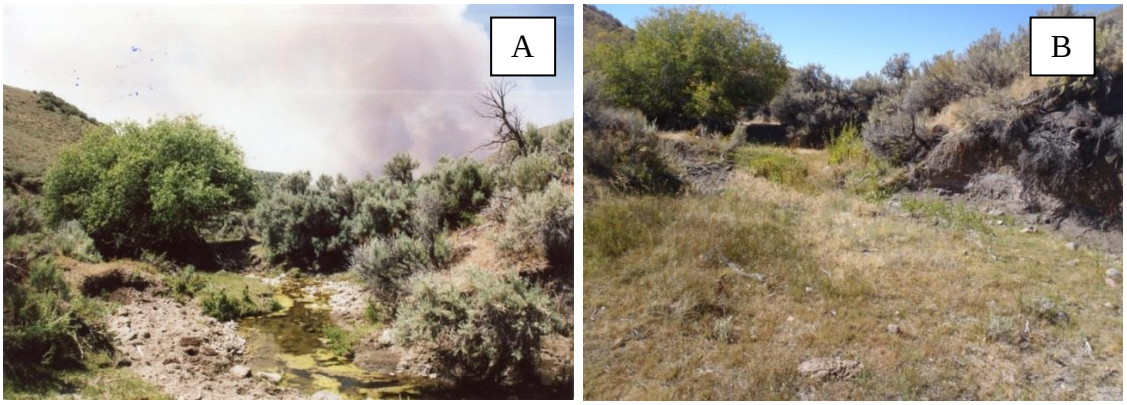


Figure 25. Middle Susie Creek, S-1, T-0, downstream, A) 2006 B) 2011.



A.14. Wildlife Habitat Data

A total of four key wildlife habitat monitoring transects are located on the allotment as follows (refer to Appendix B, Map 1):

- DW-T-87-03 – Susie Pasture
- DW-4-01 – Susie Pasture (Affected by the 2006 Suzie Fire)
- DW-4-05 – West Avenal Pasture
- CDS-T-87-04 – Stinson Pasture (Affected by the 2006 Basco Fire)

The key areas were originally established to monitor habitat conditions for mule deer; however, data collected at the key areas can be used to indicate habitat condition for a number of key species including sage-grouse, as applicable. Data used to develop an overall habitat condition rating, including forage quality, line intercept, vertical cover, disturbance factors, and browse and vigor (form and age class) were collected at the key areas between 1982 and 2012. In addition, key browse (antelope bitterbrush) recruitment data has been collected at two key areas as part of post-2006 wildfire livestock closure monitoring. Photos and ocular estimates of vegetative components at a BLM Range key area KA-08 in the Stinson Riparian Pasture, on a crested wheatgrass seeding area that provides potential sage-grouse nesting habitat were completed in 2012 (Section A.15, Figure 31).

Components of the Overall Habitat Condition Rating are discussed below:

Vegetative Composition, Diversity and Cover - Line intercept studies provide a method for collecting vegetative cover (canopy and basal cover) shrub, grass, and forb species composition data. Relative to monitoring the availability of lateral nesting cover for sage-grouse, the "droop height" of herbaceous perennial native plant canopy cover was monitored at Key Area CDS-T-87-04 in 2012.

Vegetative Shrub Height , Foliar Cover and Condition - Vertical cover data provides a way to evaluate changes in vegetation structure and helps determine whether cover is adequate for wildlife species . In addition, shrub height measurements were recorded along the line intercept transect in 2012.

Browse Form and Age Class - Browse form and age class data are used to determine if overuse is occurring on important browse species and if the age class diversity is providing for the needs of the wildlife species and is adequate to maintain the health of the vegetative community.

Disturbance/Interference Factors -Livestock control fencing, as disturbance or interference factors, were also documented between 2005 and 2012 and considered for the big game habitat rating system. The facilitation of big game movements under or over livestock control fencing was not considered at the time that many fences on the allotment were constructed or existed during, or prior to, the range adjudication process (e.g. 1940s to 1960s era or earlier). Fence hazards in big game and sage-grouse seasonal use habitat areas are a concern. Wire spacing modifications, as well as other methods, help make the fence outline more visible and help to minimize the potential for entanglement with fence wires. Modifications on potential fence hazards, to BLM specifications, have been completed on public lands in the allotment. This

includes, post-wildfire repair or reconstruction of BLM administered allotment boundary and pasture division fence projects, and approved cooperative projects. Additional work on public lands, and any coordinated effort on private lands, is needed as part of long-term efforts on the Elko District.

Other Monitoring Information

The information shown above can be used, along with additional monitoring data such as herbaceous utilization and ecological status condition to make determinations regarding the quality of habitat the area is providing for wildlife species, including sage-grouse and mule deer. Scientific references (Gregg 1994, Winward 1991, and Connelly et al. 2000) were also used to help make any determinations on sage grouse habitat quality.

Results of monitoring studies for priority wildlife species are discussed below.

Mule Deer Habitat

Data collected at the key area was analyzed for mule deer habitat using the BLM's WILDIVE program, which calculates a vegetative diversity index based on percent composition and preference for species present at the key area. This information is used along with other factors such as water distribution, vegetative production, percent cover, vertical cover, disturbance or interference factors and browse condition, as mentioned above, to calculate a habitat condition rating for mule deer.

Mule Deer Habitat Condition ratings ranged from "Fair" to "Excellent" condition on four key monitored between 1982 and 2012. In 2012, Key Study Transect DW4-01 was rated as being in "Fair" condition as a result of impacts from the 2006 Susie Fire. It rated being in "Good" condition in 2005 prior to the same fire. The remaining three study transects rated at being in "Good" condition at two transects and "Excellent" at the other transect. Wyoming big sagebrush is being affected by drought conditions and apparent Aroga moth (a.k.a. "Sagebrush Defoliator Moth") infestations on lower elevation winter range areas as of 2012. Pasture division fencing, including spans with five strands of barbed wire with top wire 48 inches high and bottom strand 12 inches above the ground, is present and needs to be modified to facilitate big game/other wildlife movements.

Sage-Grouse Habitat Monitoring

Specific objectives for sage-grouse habitat in terms of vegetative composition were not established in the Elko Resource Management Plan; however, the BLM in Nevada has established interim sage-grouse management guidelines (2000 Management Guidelines for Sage Grouse and Sagebrush Ecosystems in Nevada). These guidelines were based on Western Association of Fish and Wildlife Agencies (WAFWA) draft guidelines and Oregon Bureau of Land Management sage-grouse management guidelines. These guidelines outline optimum ("good") habitat conditions based on WAFWA habitat descriptions by life cycle for sage-grouse and other pertinent research, and provide a basis for evaluating habitat conditions, taking into account actual site potential. The BLM signed a Memorandum of Understanding with other Federal agencies and WAFWA to consider these guidelines in the land use planning process.

A summary of characteristics of sagebrush rangeland needed to help provide productive sage-grouse habitat in an arid site compared to characteristics monitored on the allotment in 2005 and 2012 are summarized in Table 14 below.

Table 14. Blue Basin Allotment, Sage-grouse Habitat, Key Area CDS-T-87-04.

Year	Breeding Habitat		Brood-rearing Habitat		Winter Habitat	
	Droop Height (cm)	Canopy Cover (%)	Droop Height (cm)	Canopy Cover (%)	Droop Height (cm)	Canopy Cover (%)
Sagebrush Veg. Type						
2005	49.0	34.4	49.0	34.4	49.0	34.4
2012	36.3	6.8	36.3	6.8	36.3	6.8
*Optimal**	*30-80*	*15-25*	*40-80*	*10-25*	*25-35*	*10-30*
Grass-Forb Veg. Type						
2005	32.2	57.9	32.2	57.9	--	--
2012	28.7	17.0	28.7	17.0	--	--
*Optimal**	*>18*	*≥15*	*Variable*	*≥15*	*N/A*	*N/A*

*Characteristics of sagebrush rangeland needed for productive sage-grouse habitat (Connelly, et al. 2000).

Green rabbitbrush was the sole shrub species intercepted on transect in 2012. Values for height and canopy coverage are for shrubs, exposed above snow which was not monitored. Grasses and forbs measured as droop height; the highest naturally growing portion of the plant.

Table 14 above illustrates characteristics of sagebrush rangeland needed for productive sage grouse habitat in arid sites, mesic and arid sites. These characteristics should be defined on a local basis; annual precipitation, herbaceous understory, and soils should be considered (Tisdale and Hironaka 1981, Hironaka et al. 1983). The big sagebrush-bitterbrush vegetation type (an arid site) monitored on the key area transect on the allotment, the guidelines go on to say, "Because of gaps in our knowledge and regional variation in habitat characteristics (Tisdale and Hironaka 1981), the judgment of local biologists and quantitative data from population and habitat monitoring are necessary to implement the guidelines correctly." With this consideration, the following studies would help to provide information regarding attainment of satisfactory sage-grouse nesting cover specific to the key area monitoring location on the allotment:

Sage Grouse Nesting Cover Studies- Information obtained from a 1994 sage grouse nesting habitat study in Oregon (Gregg et al. 1994) indicated that the following factors would help improve sage grouse nesting success:

> 1) an average of 8-12% shrub canopy (live foliar) cover within the Wyoming big sagebrush vegetation type and 15-20% cover within the basin or mountain big sagebrush vegetation types that averages 16-32 inches in height, and,

2) an average of 18% aerial (canopy) cover of tall genera grasses with height greater than 7 inches.

Sagebrush Grasslands Studies - Winward (1991) found that collective shrub foliar cover of 8-12% for the Wyoming big sagebrush vegetation type and 15-20% for the basin or mountain big sagebrush vegetation types resulted in little competition between sagebrush and herbaceous species. The 2006 Susie Fire negatively impacted shrub growth on Key Area CDS-T-87-04, albeit that successful big sagebrush-Western yarrow seeding efforts are evident in seeded strips in the vicinity of the key area transect. Considering the potential umbrella-type foliar cover provided by bitterbrush and other shrubs on areas characterized by the big sagebrush-bitterbrush vegetation type, shrub foliar values around 20-30% would likely have the same results. These ranges of shrub foliar cover values specific to vegetation types with key browse age and form class in satisfactory condition, coupled with understory perennial herbaceous vegetation that reflects upper mid-seral to late seral ecological status, would help to provide suitable wildlife habitat on native sagebrush rangelands with satisfactory wildlife forage and cover diversity.

2005 Monitoring

Monitoring data collected in 2005 indicate that sage-grouse breeding habitat (nesting), brood-rearing habitat, and winter habitat quality are within appropriate WAFWA guidelines when considering the big sagebrush mountain shrub vegetation type shrub height and umbrella-type shrub foliar cover, and perennial native species "grass-forb" height to support height recommendations and foliar cover values for nesting and brooding. The percentages shown in Table 14 indicate that sufficient vegetative cover was available at the time to help provide successful nesting and brood-rearing during critical periods for sage grouse and migratory birds. Cheatgrass was sampled on this site with 1.8% of relative species composition recorded in 2005.

Sage Grouse Early (Upland) Brood-Rearing Habitat – This habitat is generally in the vicinity of nesting habitat out to several miles or more away on upland areas with sagebrush as the primary shrub cover. Monitoring data collected during June 30, 2005 efforts indicated that the diversity of species, including forbs needed for dietary intake, was satisfactory in comparison to site potential. Herbaceous canopy cover was 57.9% which exceeds recommended ranges for productive brood-rearing habitat. See narrative on shrub cover mentioned above.

Sage Grouse Summer Habitat and Late (Riparian/Meadow) brood-rearing habitat – This habitat is primarily associated with riparian/meadow areas. Lentic riparian habitat (seeps, springs) have improved by either meeting lotic (flowing water) and lentic objectives, or making progress towards the same (Section A.10 – Riparian and Wetland). These conditions help to provide satisfactory brood-rearing habitat as well as allow the areas to expand and increase in size.

Sage Grouse Winter Habitat - The shrub foliar cover was 34.4%; this included 21.3% sagebrush cover (average sagebrush height was 24.8 inches) with collective shrub height at 19.3 inches. Although this 34.4% cover was higher than WAFWA's 10-30% guidelines, umbrella-type cover provided by bitterbrush, and green rabbitbrush coupled with big sagebrush cover, help to provide satisfactory winter habitat for sage grouse. No measurements were recorded above variable snow cover.

2012 Monitoring

The 2006 Susie Fire negatively impacted sage grouse habitat. As of August 12, 2012, sagebrush exists as isolated plants to scattered stands of plants associated with post-wildfire seeding efforts. Bitterbrush was "severely" impacted by the wildfire where samples for monitoring were collected primarily within or near intact stands in the vicinity of the key area, although some burned plants re-sprouted. Green rabbitbrush was the only shrub species sampled on the transect. This plant has re-sprouting capabilities after a wildfire and is considered an early successional species. Satisfactory nesting habitat is not likely until ongoing establishment of sagebrush occurs as mentioned above under Sage Grouse Nesting Cover Studies. However, native (Figure 29) and planted herbaceous plant species (including Western yarrow) would allow for brood-rearing habitat, particularly, within seeded areas including draws, swales, ephemeral drainage areas with, at least, eight percent shrub foliar cover. Limited nesting cover could be provided within scattered stands of sagebrush on the area with similar understory values as sampled on the transect.

A.15. Wildlife Habitat Photographic Data

Figure 26. Key Browse Species, Bitterbrush, DW-4-05, Blue Basin Allotment, 2012

Figure 27. Key Browse Species, Bitterbrush, DW-T-87-03, Blue Basin, 2012.

Figure 28. Line Intercept, DW-4-01-03, Blue Basin, A) 2005, B) 2012

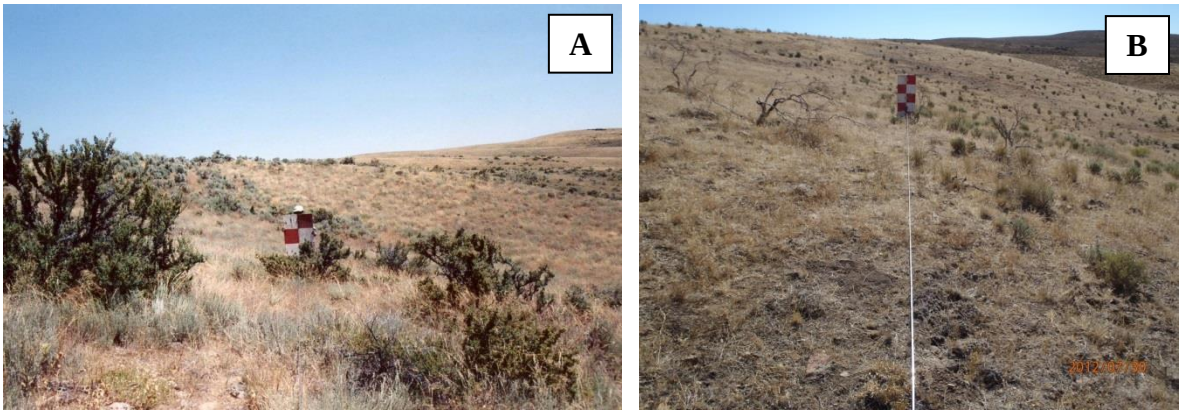
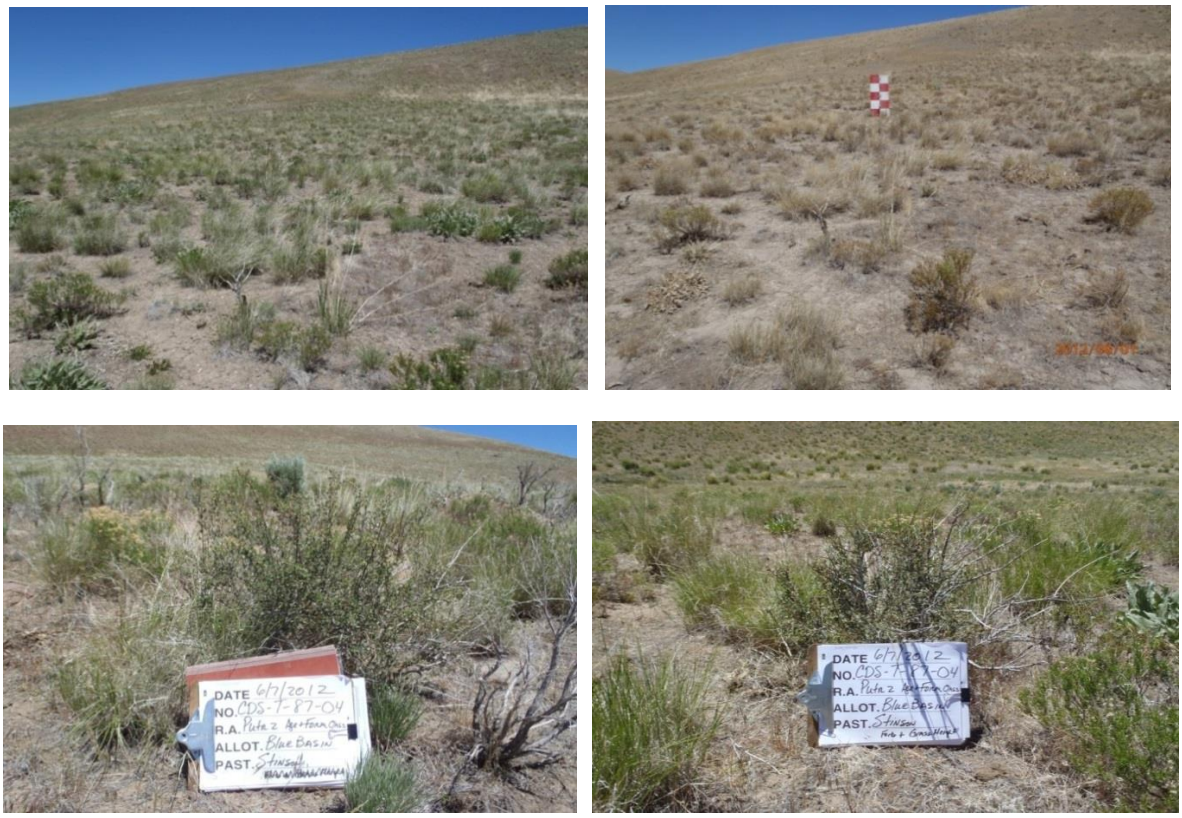


Figure 29. Blue Basin Allotment, Key Area CDS-T-87-04, 2012.



In June of 2012, post-fire (Basco Fire) re-sprouted bitterbrush in satisfactory form class and perennial grass/forb plant growth with average of 11.3 inches of droop height was recorded.

Figure 30. Blue Basin Allotment, Key Area CDS-T-87-04, 2005.

Photos and ocular estimates of vegetative components at an area on a crested wheatgrass seeding that provides potential sage-grouse nesting habitat was completed in 2005.

Figure 31. Potential sage-grouse nesting and early brood-rearing habitat, KA-8, 2012.

Although no monitoring was completed at range key area KA-08, an ocular estimate suggested that the seeding area provides potential nesting and early (upland) brood-rearing habitat. The seeding is located less than a mile from the CDS-T-87-04 study transect and in close proximity

to several perennial water sources with riparian vegetation, and meadow areas. Crested wheatgrass/mixed native grass and forb height and cover likely met or exceeded WAWFA guidelines and big sagebrush shrub cover was present in 2012 and prior years.

Figure 32. Blue Basin Allotment, Active Pygmy Rabbit Habitat, 2012.

A.16. Special Status Species

The Blue Basin Allotment supports a number of wildlife species designated as special status (Appendix C). These include BLM sensitive species and species listed by the State of Nevada as having special status. Nevada BLM policy is to provide State of Nevada Listed Species and Nevada BLM Sensitive Species with the same level of protection as is provided for candidate species (BLM Manual 6840.06C). Special status species considered to be "focus species" for the Blue Basin Allotment are discussed below:

Greater Sage-Grouse (RMP-featured species)

The Greater Sage-Grouse (sage-grouse) was designated as a candidate species for listing under the Endangered Species Act by the U.S. Fish and Wildlife Service in 2010. This species is also considered to be an "umbrella species" (Rowland et al. 2006) where positive or negative impacts to their habitat generally affect the habitat for other sagebrush-obligate species or other species that utilize similar upland and riparian/meadow habitat on a seasonal or yearlong basis.

The allotment is within the North Fork Sage Grouse Population Management Unit (PMU) in Nevada. PMUs are being considered under the Governor's Nevada Sage Grouse Conservation Strategy by the Northeastern Nevada Stewardship Group as part of sage grouse conservation planning efforts underway for the Elko District. Shrub cover and associated native herbaceous plants in the understory are vital as forage and cover components for sage grouse. Evaluation of habitat values and the possibilities to improve these values are considered through this conservation effort. One of the risks identified for the North Fork PMU under "Livestock" is "Allotment Evaluations – need updates." This at-the-time (2004) risk was aimed towards the need for formalized livestock grazing management plans on Federal grazing allotments that

provide sage-grouse habitat. Additional guidance on management of sage-grouse and sage-grouse habitat has been provided for in BLM in 2000 and 2012.

The majority of the allotment is within "Category 1" (Essential/Irreplaceable Habitat) and "Category 2" (Moderately Important Habitat) sage- grouse habitat as designated by NDOW in March 2012. These categories are equivalent to "Preliminary Priority Habitat" as designated by BLM in March 2012.

The majority of the allotment provides breeding habitat including lek areas (traditional locations for courtship display by male grouse, also called "strutting grounds"), lek-associated rest/roost/foraging areas, and nesting habitat. The area also provides documented "early" (upland) and "late" (meadow/riparian) brood-rearing/summer and fall/winter habitat for sage-grouse. There are 17 known lek locations within the "Upper Humboldt/Susie Creek Lek Complex" that are either within the allotment or are within several miles from the allotment boundary. In addition, there could be sage-grouse movements into the area from outside the allotment area as individual or groups of grouse seek seasonal use areas.

Areas of riparian/meadow habitat are important for brood-rearing on the allotment, especially during the summer and early fall as forbs desiccate (dry-out) on upland areas. Forbs are an essential part of the diet of young sage grouse. Hen sage grouse that nest outside the allotment area could potentially move their broods considerable distances seeking riparian/meadow areas that provide succulent forbs on the allotment.

Pygmy Rabbits (BLM Sensitive)

Pygmy rabbits are found in various vegetation types that include big sagebrush that are suitable for creating their burrow system. Observations in Nevada have been made over broad areas including those characterized by the mountain, basin and Wyoming big sagebrush vegetation types and the big sagebrush-bitterbrush vegetation type. Relative to the area, the highest likelihood of occurrence would be on sites that support "pockets" or contiguous stands of big sagebrush adjoining riparian/meadow or ephemeral drainage areas.

The area provides documented pygmy rabbit habitat. Active burrows and fresh pellets were located within basin big sagebrush stands on the upper banks of an intermittent drainage area during a cursory search on June 7, 2012 (Figure 32 above). A pygmy rabbit and burrow was documented on similar habitat along the perennial flow of Susie Creek on an adjoining grazing allotment on the same date. Formal surveys would be needed to confirm the extent of habitat use on the allotment. At a minimum, the Susie Creek drainage, which includes scores of perennial, intermittent and ephemeral drainage areas, and intact surrounding uplands, provide hundreds of acres of suitable habitat on the Blue Basin Allotment.

Golden Eagle

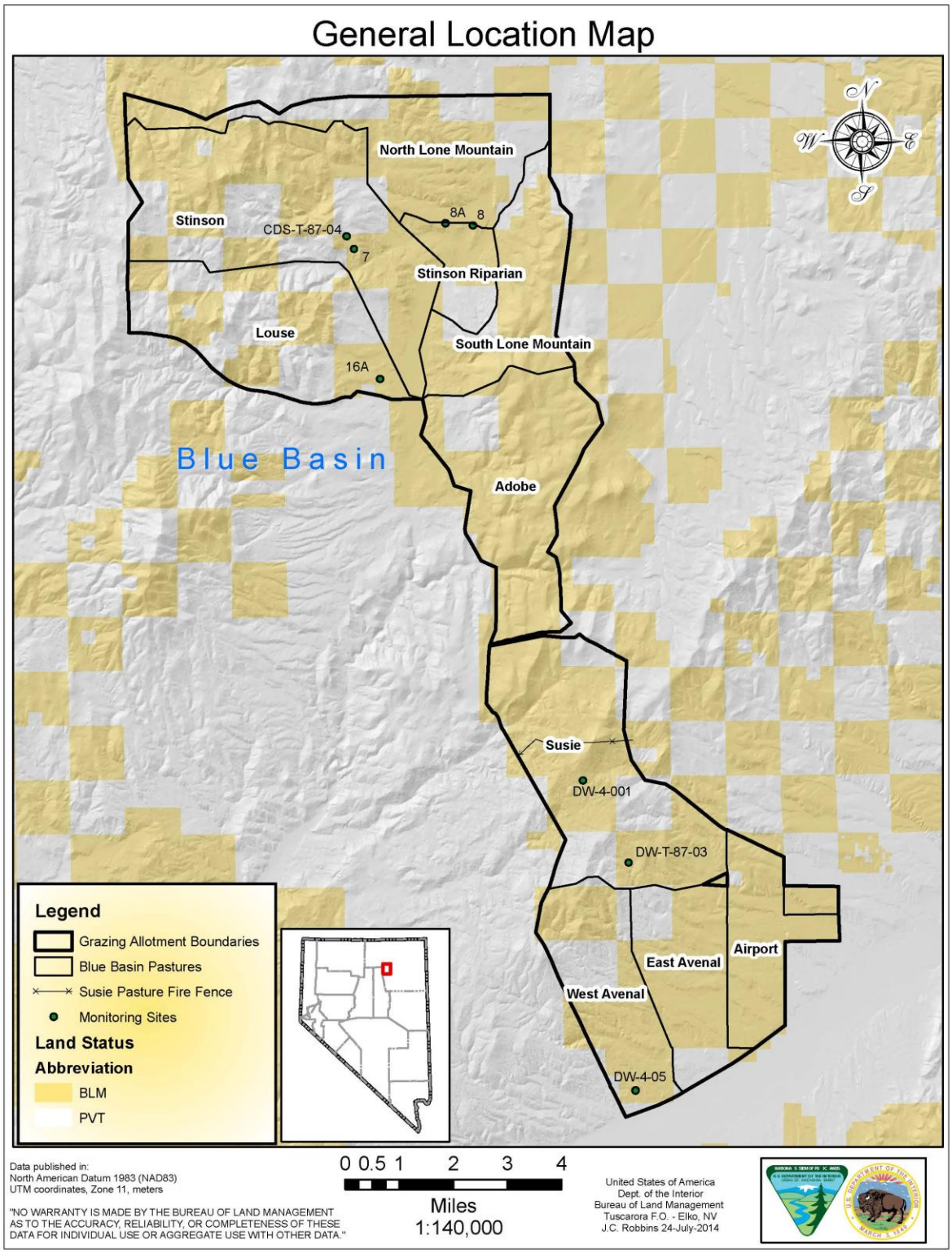
Golden eagles are protected under the 2007 Bald and Golden Eagle Protection Act. This species has been documented in the Blue Basin Allotment. Mountainous terrain areas with rock outcrops provide nesting habitat. Upland areas and interspersed riparian/meadow areas provide foraging habitat where prey species are primarily small mammals.

Migratory Birds

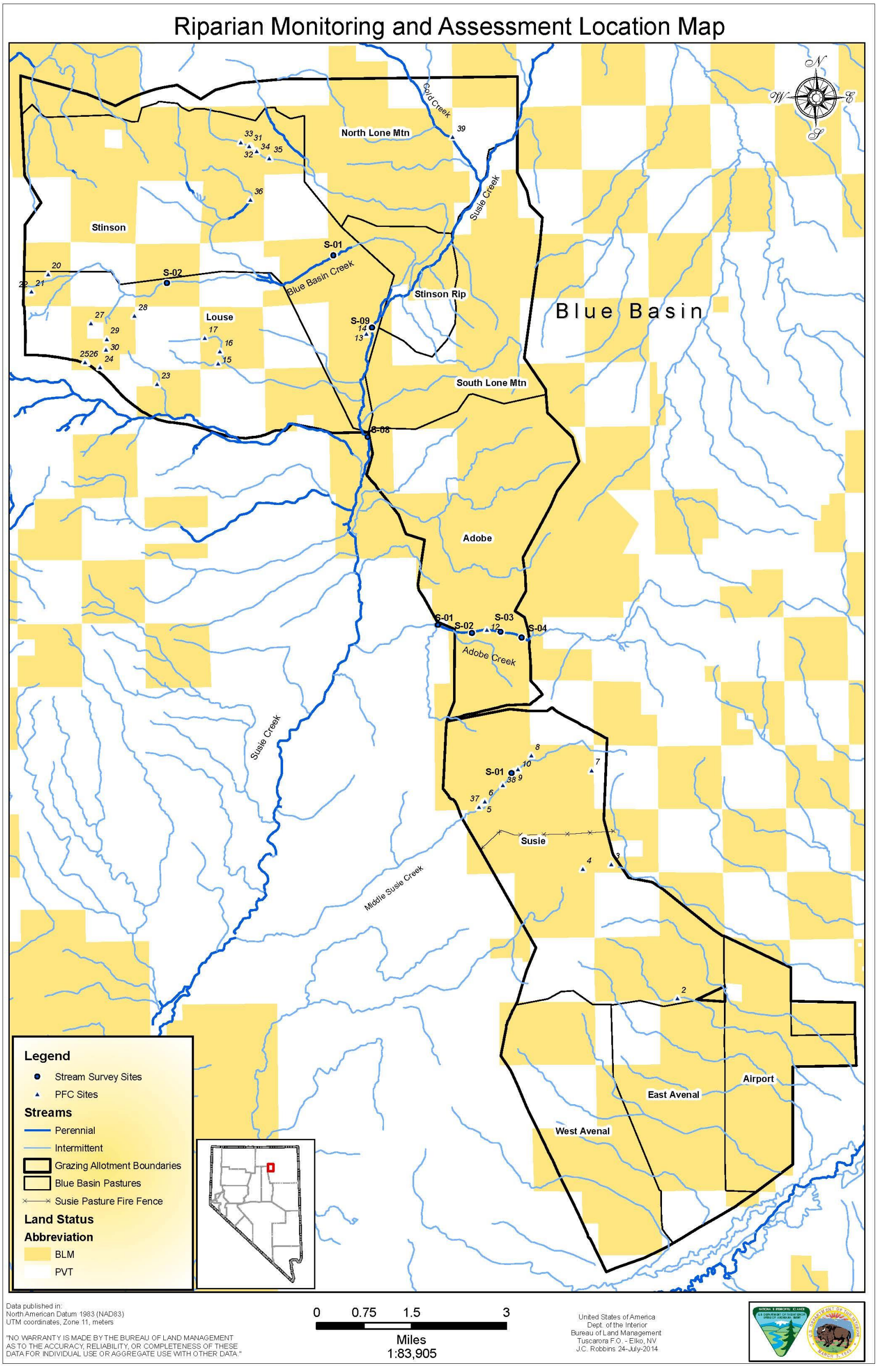
On January 11, 2001, President Clinton signed the Migratory Bird Executive Order 13186. It directs executive departments and agencies to take certain actions to further implement the Migratory Bird Treaty Act and to conserve migratory birds. The Blue Basin Allotment supports important habitat for many species of migratory birds.

Appendix B. Maps

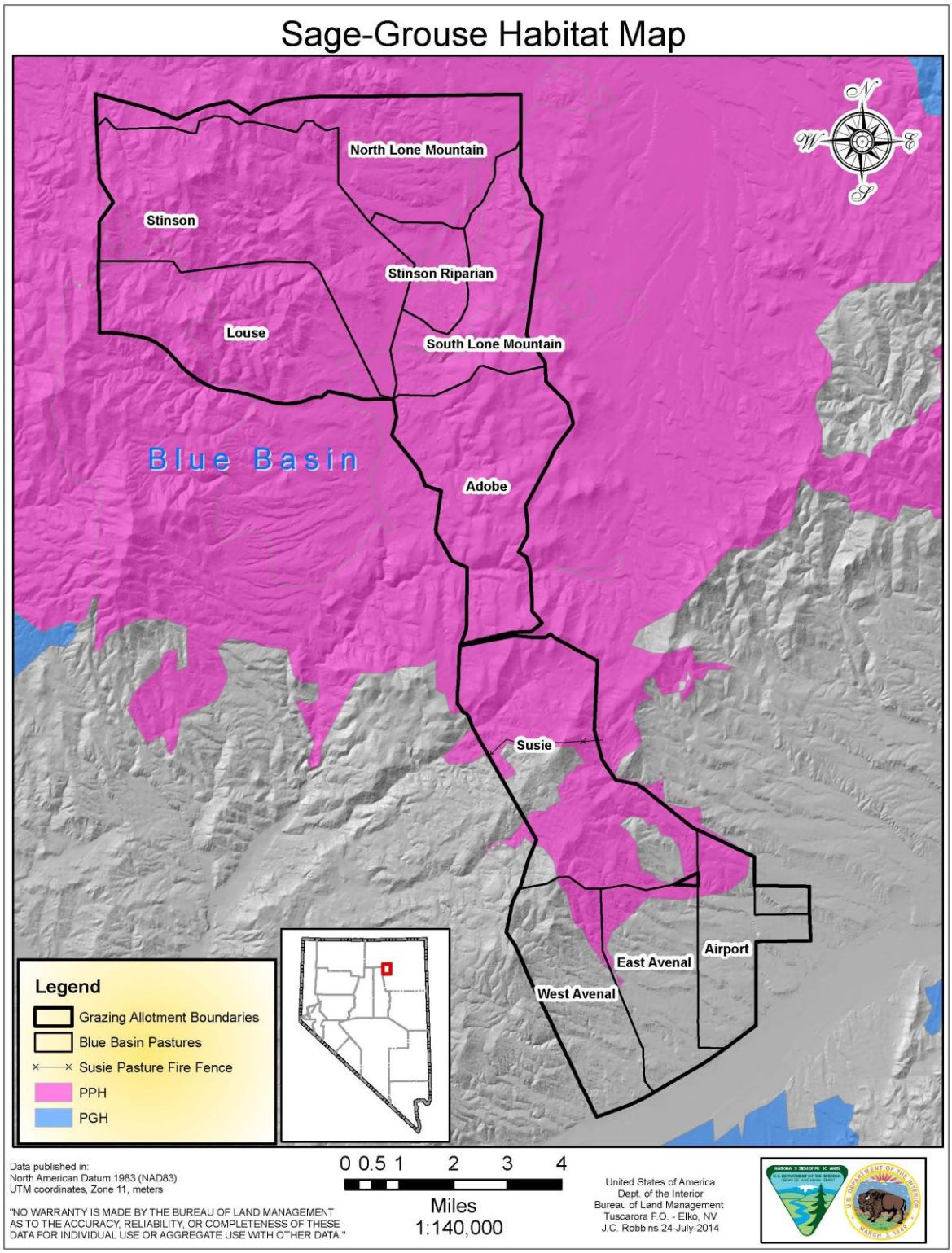
Map 1. General Location and Key Area Location Map of Blue Basin Allotment.



Map 2. Riparian Monitoring and Assessment Location Map Blue Basin Allotment.



Map 3. Sage-Grouse Habitat Map of Blue Basin Allotment.



Appendix C. Elko BLM Special Status Species

Scientific Name	Common Name	USFWS Status[1]	NV Range[2]	BLM Criteria[3]
Amphibians				
Rana pipiens	northern leopard frog		YR	1,2
Rana luteiventris	Columbia spotted frog (including Toiyabe spotted frog subpopulation)	Candidate	YR	1,2
Birds				
Falco peregrinus	Peregrine Falcon		YR	
Accipiter gentilis	Northern Goshawk		B	1
Aquila chrysaetos	Golden Eagle		YR	2
Haliaeetus leucocephalus	Bald Eagle		YR	1
Buteo regalis	Ferruginous Hawk		B	1,2
Buteo swainsoni	Swainson's Hawk		B	1
Centrocercus urophasianus	Greater Sage-Grouse	Candidate	YR	1
Charadrius alexandrinus nivosus	Western Snowy Plover	T	B	1,2
Lanius ludovicianus	Loggerhead Shrike		YR	1
Leucosticte atrata	Black Rosy-Finch		YR	2
Melanerpes lewis	Lewis' Woodpecker		YR	1
Gymnorhinus cyanocephalus	Pinyon Jay		YR	
Oreoscoptes montanus	Sage Thrasher		B	1
Fish				
Gila bicolor isolata	Independence Valley tui chub		YR	2
Gila bicolor newarkensis	Newark Velley tui chub		YR	2
Lepidomeda copei	Northern leatherside chub		YR	1
Oncorhynchus clarki henshawi	Lahontan cutthroat trout	T	YR	1,2
Oncorhynchus mykiss gairdneri	inland Columbia Basin redband trout		YR	2
Relictus solitarius	relict dace		YR	2
Rhinichthys osculus lethoporus	Independence Valley speckled dace	E	YR	1,2
Rhinichthys osculus oligoporus	Clover Valley speckled dace	E	YR	1,2
Salvelinus confluentus	Bull trout	T	YR	1,2
Mammals				
Antrozous pallidus	pallid bat		YR	2

Corynorhinus townsendii	Townsend's big-eared bat		YR	1,2
Euderma maculatum	spotted bat		YR	1,2
Eptesicus fuscus	big brown bat		YR	2
Lasionycteris noctivagans	silver-haired bat		YR	2
Lasiurus cinereus	hoary bat		B	2
Myotis californicus	California myotis		YR	2
Myotis ciliolabrum	western small-footed myotis		YR	2
Myotis evotis	long-eared myotis		YR	2
Myotis lucifugus	little brown myotis		YR	2
Myotis thysanodes	fringed myotis		YR	2
Myotis yumanensis	Yuma myotis		YR	2
Pipistrellus hesperus	western pipistrelle		YR	2
Tadarida brasiliensis	Brazilian free-tailed bat		YR	2
Brachylagus idahoensis	pygmy rabbit	petitioned	YR	1
Sorex preblei	Preble's shrew		YR	2
Ochotona princeps	pika		YR	1,2
Reptiles				
none				
Insects				
Euphilotes pallescens mattonii	Mattoni's blue butterfly		YR	2
Molluscs				
Anodonta californiensis	California floater		YR	2
Pygulopsis humboldtensis	Humboldt pyrg		YR	2
Pyrgulopsis villacampae	Duckwater Warm Springs pryg	petitioned 2009	YR	2
Pyrgulopsis vinyardi	Vinyards pyrg		YR	1,2
Tryonia clathrata	Grated tryonia	petitioned 2009	YR	1,2
Plants				
Antennaria arcuata	Meadow pussytoes	Species of Concern		1, 2
Astragalus anserinus	Goose Creek milkvetch	Candidate		1, 2
Boechera falcifructa	Elko rockcress	Species of Concern		1,2
Collomia renacta	Barren Valley collomia	Species of Concern		1, 2
Erigeron latus	Broad fleabane	Species of Concern		1, 2
Eriogonum beatleyae	Beatley buckwheat			1

Eriogonum lewisii	Lewis buckwheat	Species of Concern	1
Eriogonum nutans var. *glabratum*	Deeth buckwheat		1
Ivesia rhypara var. *rhypara*	Grimy mousetails	Former candidate	1
Lathyrus grimesii	Grimes vetchling	Species of Concern	1,2
Lepidium davisii	Davis peppercress	Species of Concern	1, 2
Leptodactylon glabrum	Owyhee prickly phlox	Species of Concern	2
Mentzelia tiehmii	Tiehm blazingstar		1
Penstemon idahoensis	Idaho beardtongue		2
Phacelia minutissima	Least phacelia	Species of Concern	2
Potentilla cottamii	Cottam cinquefoil	Species of Concern	1
Ranunculus triternatus	Obscure buttercup		1
Silene nachlingerae	Nachlinger catchfly	Species of Concern	1

[1]**Candidate**: Species for which the FWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the Endangered Species Act, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.
Petitioned: petitioned for listing as a Threatened or Endangered species.
T: Listed as Threatened.
E: Listed as Endangered.
Species of Concern: An informal term used to refer to species that are declining or appear to be in need of conservation.

[2]**YR**: Year-round resident
B: Breeding season resident

[3]**1.** There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or
2. The species depends on ecological refugia or specialized or unique habitats on BLM-administered lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk (From BLM Manual 6840-Special Status Species Management).

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Appendix D. Plant Codes Identification

Plant Code	Common Name	Scientific Name
AGCR	Crested wheatgrass	*Agropyron cristatum*
AGDA	Thickspike wheatgrass	*Agropyron dasystachyum*
AGGL (AGOS)	Pale Agoseris	*Agoseris glauca*
AGSM	Western Wheatgrass	*Agropyron smithii*
ALLIUM	Tapertip onion	*Allium acuminatum* Nutt.
ARABIS	Rockcress	*Arabis* L.
ARAR	Little Sagebrush	*Artemisia arbuscula*
ARTRW	Wyoming Big Sagebrush	*Artemesia tridentata* spp. *wyomingensis*
ASTRAG	Milkvetch	*Astragulus* L.
ASTER	Aster	*Aster* L.
BASA	Arrowleaf Balsamroot	*Balsamorhiza saggitata*
BRTE	Cheatgrass	*Bromus tectorum*
COPA	Maiden blue eyed Mary	*Collinsia parviflora*
CRAC2	Tapertip Hawksbeard	*Crepis acuminata*
CRYPT	Cryptantha	*Cryptantha Lehm*. Ex G. Don
DELPH	Larkspur	*Delphinium* L.
ELEL (SIHY)	Squirrelltail	*Elymus elemoides*
EPILO	Willowherb	*Epilobium* L.
ERIOG	Buckwheat	*Eriogonium* Spp.
CHNA	Rubber Rabbitbrush	*Ericameria nauseosa*
CHVI	Green Rabbitbrush	*Ericameria teretifolia*
FEID	Idaho fescue	*Festuca idahoensis*
GADID (GAYOP)	Spreading groundsmoke	*Gayophytum diffusum*
GILLIA (GIBR)	Gilia	*Gilia* ssp.
LECI (ELCI)	Great Basin Wild-rye	*Leymus cinerus*
LEPU	Common Pepperweed	*Lepidium densiflorum* Schrad.
LIRU4	Western Stoneseed	*Lithospermum ruderale*
LOMAT	Desertparsley	*Lomatium* Raf.
LUPIN	Lupine	*Lupinus* L.
ORHY	Indian Ricegrass	*Oryzopsis hymenoides*
ORTHO (ORPU3)	Owls-Clover	*Orthocarpus* Nutt.
PENST	Palmer's Penstemon	*Penstemon palmeri*
PHHO	Hoods phlox	*Phlox hoodii*
PHLO	Longleaf Phlox	*Phlox longifolia*
POSE	Sandberg's bluegrass	*Poa secunda*
PPFF	Unknown Perennial Forb	--
PSSP (AGSP)	Bluebunch wheatgrass	*Pseudoregeneria spicata*
PUTR	Antelope bitterbrush	*Purshia tridentata*
RATE	Curveseed butterwort	*Ceratocephala testiculata*
STTH	Thurber’s needlegrass	*Stipa thurberianum*

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Appendix E. References

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